SYSTEMS

Arts Council 1972-3

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Richard Allen
John Ernest
Malcolm Hughes
Colin Jones
Michael Kidner
Peter Lowe
James Moyes
David Saunders
Geoffrey Smedley
Jean Spencer
Jeffrey Steele
Gillian Wise Ciobotaru

1972	8 March	– 9 April	London, Whitechapel Art Gallery
	22 April	– 13 May	Manchester, Whitworth Art Gallery
	3 June	– 24 June	Sheffield, Graves Art Gallery
	8 July	– 29 July	Billingham, Art Gallery
	12 August	– 3 September	Newcastle, Laing Art Gallery
	23 September	– 15 October	Birmingham, City Art Gallery
	28 October	– 10 December	Leicester, Art Gallery and Museum
1973	22 December	– 21 January	Leeds, City Art Gallery
	3 February	– 25 February	Southampton, Art Gallery
	10 March	– 1 April	Newport, Museum and Art Gallery
	2 June	– 1 July	Oxford, Museum of Modern Art

Foreword by Norbert Lynton, Director of Exhibitions

This exhibition has a special significance for the Arts Council. We arrange one-man, mixed and thematic exhibitions of contemporary art, but this is the first occasion on which we have shown the work of a number of British artists who see themselves as a group.

The artists in the Systems group came together for an exhibition of contemporary British art organised by Jeffrey Steele at the invitation of the Amos Anderson Museum, Helsinki. He chose nine artists whose interests were associated with his own developing interest in the theory of syntax in art. The exhibition was held in November 1969 and in 1970 a more rigorously defined and augmented group of 12 artists approached the Arnolfini Gallery, Bristol and the Arts Council with a view to arranging a similar exhibition in England. Both welcomed the proposal and in June 1971 the Arnolfini Gallery presented an exhibition, under the title 'matrix' which comprised single paintings and reliefs by the twelve artists.

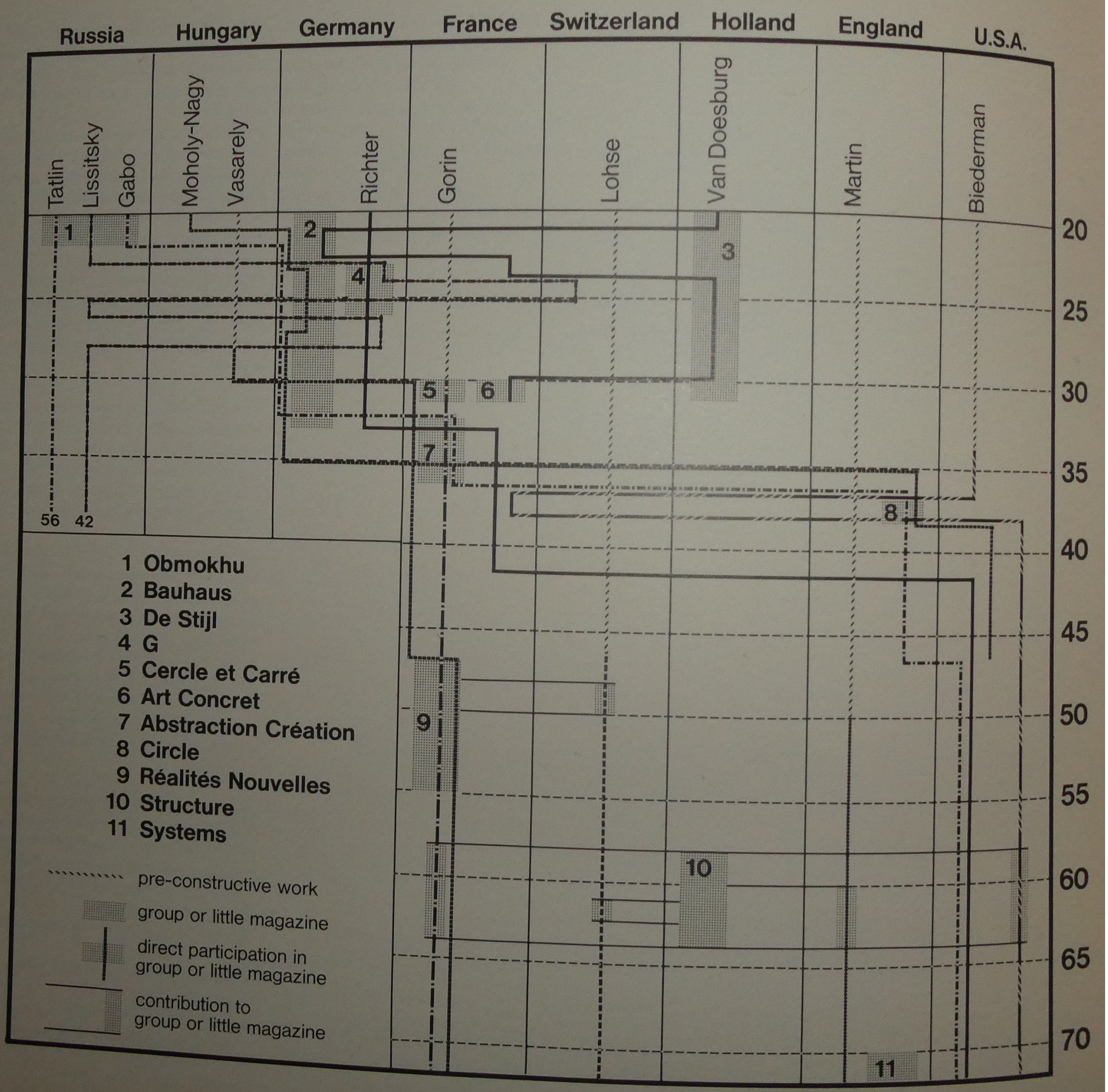
The Systems group exists for the purposes of discussion and exhibition rather than direct collaboration. It is an informal association in which each individual pursues his own path; there is no joint manifesto, only a shared, intense interest in factors such as order, sequence, rhythm and structural relationships and in an art which investigates and discloses these phenomena.

The present exhibition demonstrates this division between the individual and the collective. Each artist is represented in the exhibition by a single work, by preparatory material and studies for that work and in the catalogue by a statement. The works have been specially commissioned by the Arts Council and in some instances they mark a radical departure from, or an extension of existing practice. Seen as a synthesis of individual pursuits the exhibition demonstrates the group's collective interests, while the opening section shows how these interests connect with comparable concerns amongst certain contemporary poets and musicians.

Stephen Bann describes the historical context of the group and proposes that we employ the classifications found in semiology (the science of signs of which linguistics forms a part) to analyse the structures of the work exhibited and to draw parallels with other disciplines. His introduction of a linguistic approach has provided the group with a common vocabulary and wider terms of reference. We thank him most warmly for his assistance.

We should also like to thank Alan Stewart who designed the exhibition structure and layout with such care, Philip Steadman who designed the catalogue and Anthea Sieveking who took the portrait photographs. We owe a special debt to Malcolm Hughes for his assistance throughout the project, in spite of heavy commitments elsewhere.

This chart illustrates the movement of Constructivist Artists and the incidence of group activity in the period 1920-70, details of time and place are necessarily approximate and there is no attempt to include every figure of importance. (SB)



Introduction by Stephen Bann

The contemporary work of art which is, to define it on the most superficial level, geometrical can be compared to the proverbial iceberg. Over and beyond the element which offers itself, in apparent simplicity, to our apprehension there lies the nine-tenths which cannot be deciphered simply from a reading of the individual work. Where an individual artist is exhibiting, this radical divergence between what is seen and what is (or requires to be) known need not rise to the surface. It is evidently the case that the attention of the spectator is shifted on to the various formal and structural links between the works of that particular artist as they group themselves in temporal sequence. But where a group of artists is exhibiting, the burden laid upon the spectator is a much more considerable one. He is forced to abandon the comforting (though perhaps illusory) doctrine of the unifying bond created by the single artistic personality and to explore the ideological level upon which the unity of the group is based. He is confronted not with a *diachronic sequence*—the succession of an individual's work in time—but with a *synchronic practice*—the cross-section of what has been produced by a number of individuals who have chosen to associate in a group at a particular historical stage. The purpose of this introduction is to provide some of the clues in relation to which such a change of role becomes acceptable.

Once this has been said, it is perhaps necessary to define the critical enterprise with a little more circumspection. There can certainly be no fundamental difference between the task of exegesis as it is pursued in the case of a group and in that of an individual artist, granted the important proviso that the individual is fully aware of the implication of his practice as an artist. As Marcelin Pleynet has shown in his exemplary study of Matisse[1], the 'system' of such an artist can only be satisfactorily revealed through a full disclosure of his historical position, in particular his relationship to Cezanne and the 'epistemological cleavage' between the pre-Modern and the Modern for which Cezanne, more than any other artist, is responsible. But, if this is true *implicitly* of the individual artist, it is asserted *programmatically* through the existence of a group. One might hazard the suggestion that the very notion of the modern artistic group[2] is inseparably linked with a particular ideology of Modernism, and, conversely, that the attempt to communicate such an ideology leads naturally to the formation of an artistic group. Certainly the 'Systems' group, the subject of this present exhibition, would provide evidence for this point of view. What is asserted through the existence and the practice of the 'Systems' group is a direct, though historically complex, relationship to the premises of the Modern Movement. It is doubtful whether any single member of the group, however explicit his intentions and extensive his production, could have demonstrated this relationship as successfully as the present 'trans-subjective' exhibition.

My reference was to the 'premises' of the Modern Movement. Before any further attempts at setting the historical context, that proper to English artists in particular, it is necessary to establish this foundation. However difficult it may be to sort out the various currents of activity in the first quarter of the 20th century, it is—for reasons which will be obvious—much more difficult to understand the eddies and cross-currents which have succeeded them in almost half a century of ensuing art. If we can begin the record with the single focal point of an improbably schematic Cezanne (a Cezanne situated precisely at the point of 'cleavage'), we must admit that the parting of the ways comes not very long afterwards. In line with the terminology of Marcelin Pleynet, we might identify Cezanne's achievement as both a *cultural rupture*, in the sense that it perfected that view of Modernism as a *problematic* of the work of art initiated by Manet, and as a *formal revolution*, in the sense that the view of the painting as a three-dimensional projection depending on the 'point of view' of the spectator was decisively supplanted.

Already with divergence between Cubism and the Dada movement this dual achievement of Cezanne had been abrogated, with results that, in Robert Motherwell's terms, are fundamental to the whole subsequent course of twentieth century art.[3] Picasso's Cubism had begun to test the implications of the formal revolution of Cezanne, through a course of pictorial experiment that excluded the traditional correspondence between the notional position of the spectator and the three-dimensional ordering of the illusory space of the work. But by 1916 Marcel Duchamp's divergence from Cubism had signalled the arrival of 'anti-art', a form of artistic activity based not upon the reinterpretation of pictorial space by Cezanne, but upon the development of Modernism as a form of *critical discourse*. For Duchamp, it was not simply the Post-Renaissance pictorial convention that was suspect, but the whole notion of founding a course of artistic activity upon the properties of the painted surface in its material embodiment. Consequently he originated the notion of the work of art as a 'brain-fact' ('cervellité'), supported by a structure of concepts rather than by the material apparatus of canvas and wood.

It is interesting to note that the full implications of this divergence have only recently come into view, with results that are certainly significant for many of the artists within the 'Systems' group. If we relate it to the specific point of the use of systems, then it will be apparent that the implication of early Cubism is to explore the suggestive notion of painting as its own system—painting as a variety of sign-making activity which acquires its possibilities and limitations of expression from the properties of the painted surface. It must be emphasised that Picasso quite decisively turned away from this particular path, preferring to reinvent the kind of pictorial conventions that enabled him to sustain the role of a Master artist. But it must also be recognised that the achievement of Post-war American painting has been precisely that of acting out the logic of the painting as its own system. From Jackson Pollock onwards, the investigation of the Abstract Expressionists has been not so much one of actualising signs taking from culturally given systems in the *syntagm*[4] of the work, but of questioning the work—and indeed the process of working—in order to establish how it may most appropriately be a painting. Indeed the whole evolution of this movement may surely be viewed retrospectively in the light of the Post-Modernist orthodoxy of Clement Greenberg, according to whom the purpose of the painting is to fulfil the logic of its existence as a two-dimensional surface. To define the painting in terms of its capacity to offer an illusion of three dimensions is, after all, to say nothing, since the three-dimensionality is no more than a matrix within which existing cultural codes may be instanced and evoked. But to define the painting in terms of its actual two-dimensionality is to propose certain specific lines of morphological development—and to risk the possibility that these lines will soon be exhausted. It is permissible, for example, to regard the 'Stripe paintings' of Kenneth Noland as a *ne plus ultra* of the two-dimensional reductionism derived from Cubism, and ultimately from Cezanne. In these works the whole artistic enterprise has been devoted, with quite remarkable economy, to the creation of paintings *appropriate to the condition of being paintings* and *correlative to the perception of the spectator*. They exist as a massive and sustained displacement of the fixed 'point of view'.

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[1] *Marcelin Pleynet*, L'Enseignement de la Peinture, *Paris, 1971, pp. 25-98.*

[2] *Cf. my study of* Art and Artistic Groups in the Modern Period, *Paladin (forthçoming).*

[3] *Introduction to Pierre Cabanne*, Dialogues with Marcel Duchamp, *London, 1971; p.12: Picasso, as a painter, wanted boundaries. Duchamp, as an anti-painter, did not. From the standpoint of each, the other was involved in a game. Taking one side or the other is the history of art since 1914 . . .'*

Certain members of the 'Systems' group (Michael Kidner, Malcolm Hughes and Richard Allen) have been noticeably influenced by the American concept of painting as intrinsic system, as will become clear in my more detailed treatment of the English scene. At the same time, another group of members (Jeffrey Steele, David Saunders) has some affiliations with the direction of activity pursued by Duchamp and the Dada movement. It is important to note that neither the Cubists nor the Dadaists held to the view of geometry as a transcendent system. For the Cubists, the rendering of space and object in geometrical terms was always relative to the demands of the pictorial surface. For the Dadaists, the very constancy of geometrical form was a subject of critical irony. Artists such as Arp, Hausmann and Schwitters made frequent use of geometrical reduction. But, as Arp made amply clear[5], their purpose was precisely to undermine its supposedly transcendental quality: works made according to the 'law of chance' might superficially resemble those constructed according to 'geometrical law', but this would only serve to enhance the critical irony that was integral to their conception.

We have therefore traced to the Modern Movement two characteristic views of the relation of 'system' to the work of art. In one case, the painting is itself the system, in the sense that its internal syntax and its status as an object are determined by considerations intrinsic to the painter's craft and the role of the spectator. In the second, widely contrasting case, the system is only adopted as a way of achieving a critical distance from another, transcendentally based system. Arp 'constructs' his collages according to chance operations in order to controvert the rationalistic premises with which some of his contemporaries are working. As was previously noted in the case of American Abstract Expressionism, this critical use of system, implicit in the early history of the Modern Movement, has in recent years received a new injection of strength. Since, unlike the previous example, it is in no way dependent upon the specific nature of a particular medium, we can hardly be surprised to see such artists as Samuel Beckett and John Cage contributing to the development of interest in non-transcendental systems, or systems which offer a critique of systems.

In spite of these significant affiliations between contemporary approaches to systems and the pioneers of the Modern Movement, it would probably be true to say that the 'Systems' group would never have come into being if it had not been for a third 'system' approach, one which maintains an unbroken tradition of derivation from Cubism and yet differs from Cubist Formalism in all important respects. This particular direction (which such members of the group as John Ernest, Gillian Wise, Peter Lowe and Colin Jones are closely identified with) can be termed 'Constructivist', though the use of such a term immediately raises innumerable problems of classification which must, at least summarily, be attempted here.

In the first place, any use of the term 'Constructivist' in relation to the period 1917-1930 must take into account the initial disparity between Russian Constructivism and what, for want of a better term, may be called International Constructivism. The cases of overlap are many, and there can be no doubt that the various artists in question would have found it difficult, or indeed inappropriate, to apply the distinction at the time. But the fact remains that Russian Constructivism, of which we may take such figures as Tatlin, Gabo and Rodchenko as forming a paradigm of divergences, employs a different apparatus of concepts to those developed contemporaneously in Western Europe, where Theo Van Doesburg and his fellow artists of the *De Stijl* movement provide the most consistent illustration of the constructive position.

We can perhaps identify the central feature of the disparity between the 'constructive' positions of the Russian artists and those of the *De Stijl* movement by referring to the different ways in which they built upon the Cubist formula. For Tatlin, the crucial model was provided by the Cubist reliefs of Picasso, which illustrated the widest possible divergence from the concept of the represented 'subject' without at the same time abandoning such reference. Tatlin deliberately ignored the representational element in these works, and chose to see them in terms of a 'material syntax':

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[4] The use of this term from linguistics will be clarified at a later stage in this introduction.

[5] Cf. Hans Arp, On my Way *(ed. Robert Motherwell), New York, 1948.*

that is to say, a juxtaposition of forms and materials on a plane surface which had no further meaning (or 'system') than that of its own syntactic order. For Theo Van Doesburg, on the other hand, the Cubist enterprise could be seen as a process of abstraction (witness the programmatic sequence in which he 'abstracts' a cow): if the resultant product is, once again, a syntax, it is a syntax that finds its system or code in the paradigm of simple geometrical figures.

Just as these two points of orientation with regard to Cubism illustrate very different conceptions of 'constructive' procedure, so the further development of the respective positions of Tatlin and Van Doesburg leads them to very divergent positions as far as 'system' is concerned. For Tatlin, and in an even more patent way for Rodchenko and Varvara Stepanova, the aim is to establish a direct homology between the aims of the artist and those of the new revolutionary society. The 'material syntax' of the artist frees him from the transcendental idealism of the Western bourgeois tradition, just as the historical materialism of the Communist party frees the state from dependence upon traditional views of policy and government. The only system, for the revolutionary artist, is therefore the system which defines and determines the policies of the revolutionary party: in the words of the Editorial from Mayakovsky's *Lef*, art must assert its role as the 'supreme formal engineering of the whole of life.'[6] It is interesting to note that, if Van Doesburg also arrives at the notion of employing art to the benefit of the whole community, he does so by a rather different path of reasoning. For Van Doesburg, it is not the insistence of constructive (political) purpose that supplies meaning to art, but the discovery (in art) of 'elementary laws of form' that will give constructive meaning to the expressions of social purpose.

We therefore arrive at two further positions to add to those previously defined: the view of art as a 'material syntax' whose (displaced) system lies not in the realm of representation but in that of social utility, and the view of art as the articulation of a basic code or system which is in effect itself derived from the pictorial tradition but offers itself for use in all departments of plastic activity. Unlike the two positions previously detailed, both these views presume the transcendence of the system, in the first case the transcendence of the economic and productive framework and in the second case the transcendence of the vocabulary of geometrical form.

As a final contribution to this schematic survey of the uses of system implicit in the Modern Movement, we might add the mention of a position which would hardly be disavowed by any member of the present 'Systems' group. It is a position that emerges from both the Russian and the International varieties of Constructivism, though it cannot be equated with those already described.

I has been said with justice of the great Russian poet and critic, Khlebnikhov, that his intensely detailed investigations of the semantic and phonetic structure of poetry could only be explained in the final analysis by his profound, and almost mystical, conviction that there was an underlying mathematical structure in the real world, and that art offered the evidence of this structure in an accessible form.[7] In other words, one can identify with Khlebnikhov, and with the Russian Formalist critics who came after him, the belief that reality is *systematically ordered*, and that the work of art is a model of this order. In the plastic arts, the figure who testifies most eloquently to this conviction is perhaps Georges Vantongerloo, a peripheral member of the *De Stijl* group but one whose personal disagreements with Van Doesburg make it difficult to view him in the same context. With Vantongerloo, and with the *Konkrete Kunst* of Max Bill that comes to fruition at the time of the Second World War, we reach a view of system as *underlying mathematical structure*, to be evoked, enshrined, represented or otherwise instanced in the work of art. This view, and its manifold implications, will necessarily require further discussion. But for the moment, since the various paths of Modernism have been schematically presented, it is important to take a look at the precise historical features of the English situation, of which the 'Systems' group is inevitably a product.

As has already been suggested, the constructive movement in 20th century art has maintained an unbroken tradition of derivation from Cubism and the Modern Movement. In this respect it has been unique. Surrealism, though initially deriving from the Dada movement, was never consistent in its exploration of pictorial space and degenerated, at least in the period following the Second World War, into an empty Mannerism. The constructive movement, on the other hand, still flourishes today, as the present exhibition amply testifies. Yet it would be absurd to expect that this development of half a century could have taken place without important shifts in perspective and orientation. To a great extent, the growth of the movement in England has been radically dependent on these shifts. The history of its development is therefore, initially at any rate, the history of a series of episodic contacts with a phenomenon constantly displaying new aspects and emphases.

It would, of course, be futile to look for any significant contacts of this kind in the period when the constructive position was receiving its initial definition in Russia and Europe. England had had her own avant-garde movement, Vorticism, in the years immediately preceding the First World War. But the fact that Vorticism arose as a product of (and reaction to) Futurism inevitably determined its character. As the paintings of William Roberts and David Bomberg from this period clearly demonstrate, the Cubo-Futurist treatment of form was employed more as a sign of modernity—as a means of stressing the 'cleavage' of cultural discourse between the old and the new—than as a method of reconsidering the formal properties of the painted surface and the new role of the spectator. Bomberg's disinclination to respond to the overtures of the *De Stijl* movement and his subsequent adoption of a course of pictorial enquiry as remote as possible from the 'elementarist' view of form sufficiently attest the gulf between English and European artists at this stage.

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[6] *Editorial 'Whom is LEF alerting?', trans. Richard Sherwood in Form 10, Oct. 1969, p. 32.*

[7] *Cf. Tzvetan Todorov, 'Le nombre, la lettre, le mot', in* Poétique *1, 1970, pp. 102-11.*

If the Vorticists had themselves wished to emphasise the cleavage between the traditional and the modern, they had at the same time ensured that their own productions were divided by an irreducible cleavage from the young English painters of the subsequent generation. Up to around 1930 there was in effect no awareness in England of the possible implications of Modernism in the arts, though figures like Christopher Wood and Ben Nicholson were able to make discreet borrowings from the French Neo-Cubist school. It was only with the worsening of the political climate in Europe, and the consequent establishment in England of artists such as Moholy-Nagy, Mondrian, Gropius and Gabo, that the issues of Modernism were forced upon the English artist. The formation of the Circle group, and the publication of the *Circle* anthology in 1937[8], may be taken as the first convincing indications of awareness of the constructive tradition in England.

Yet, however impressive the achievement of the *Circle* anthology, it would be a mistake to imagine that it provides evidence of any fundamental transformation in the attitudes of the English artist. As Myfanwy Evans recognised at the time, the conceptions of art entertained by the exiled European artists differed radically from those of the English.[9] It would indeed be easy to conclude from a very summary review of the texts in *Circle* that only the foreign contributors—Gabo, Gropius, Mondrian etc.—were aware of the need for a critical discourse to support the Modernist enterprise. English contributors such as Ben Nicholson and Barbara Hepworth were content with more or less elliptical descriptions of their own working procedures. If the English architects of the time, such as Leslie Martin who was one of the co-editors of *Circle*, had realised the immense importance of the Modern Movement in architecture, there was still no widespread sense of the ways in which 'the constructive idea' could inform an entire aesthetic and social position. It is scarcely surprising that the activity of the Circle group had as little influence on general attitudes to artistic production as the Vorticists had in the earlier period.

We therefore reach the inescapable conclusion that the constructive tradition in English art dates from after the Second World War, since only within this relatively short span of time has there been a sufficiently large core of artists working in this direction over a significant period. Once again the state of affairs can be most easily grasped from the publication of a work involving a number of artists, in this case *Nine Abstract Artists*, published by Alec Tiranti in 1954. *Nine Abstract Artists* was very far from being a coherent declaration of constructive principle, the range of styles represented being as untidily wide as the rather amorphous term 'abstract' implied. But it did at least present the work of Kenneth Martin and Anthony Hill in a firm and unambiguous way. From these two artists, as will be shown at a later stage, the differing concerns which animate a large proportion of the 'Systems' group ultimately derive.

The subsequent development of the constructive tendency in English art, and its vital relationship to contemporary developments in the rest of the world, can be identified with two particular attempts to circumscribe the entire field of the constructive aesthetic within a general view of Modernism. It would be hard to overemphasise the importance of these enterprises both as a symbol of the common purpose in what has been achieved and as a basis for subsequent progress, although the two of them reflect very different accents on the problematic of Modernism.

The first of these attempts acquires its particular character from the fact that it arose outside Europe, and reflected the attempt to show Modernism arising from the course of Western Art diachronically: this was Charles Biederman's massive study, *Art as the Evolution of Visual Knowledge*, published in 1947. Biederman's particular achievement, both in this work and in the subsequent *The New Cezanne* (1952), was to situate the crucial stage of Modernist development with the work of Cezanne, and so to propose a course of pictorial enquiry that was a formal extension of Cezanne's work, yet avoided the Post-Cubist reductionism being practised contemporaneously by the painters of the New York school. Yet apart from this achievement, to which Biederman's own work is a sufficient tribute, Biederman also performed the necessary role of simplifying and schematising the evolution of modern art, in particular the constructive tradition, in a way that was immensely beneficial to English artists.[10] His view of the field had important omissions and other necessary limitations, deriving in part from the fact that he had composed *Art as the Evolution of Visual Knowledge* during the Second World War, when communication with Europe was virtually impossible. But he had succeeded in reinvigorating the critical discourse of the constructive tradition within the framework of an overall view of Modernism. When Joost Baljeu began to publish his magazine *Structure* in 1958, with a significant proportion of contributions from English artists, it was evident how Biederman's influence had borne fruit, though its effect had in no sense been to convert the European and English artists to his own particular orthodoxy.

The closing years of the 1950's were in effect of decisive importance in establishing the various lines of contact which were to be reinforced during the next decade. Besides the influence of *Structure*, which was to include contributions from such English artists as Kenneth and Mary Martin, Anthony Hill and Peter Lowe besides those of Neo-plasticists like Jean Gorin and Concrete artists like Richard Lohse, there were also other indications from Europe that the vogue of 'lyrical abstraction' in the manner of the Ecole de Paris was no longer paramount, and that new manifestations of the constructive tendency were in evidence. The publication of *Kalte Kunst* in 1957, which exemplified the development from the Concrete aesthetic to problems of design programming in the work of Swiss artists like Graeser and Gerstner, pointed to a more productive direction than the activities of certain 'New Tendency' groups which were under way by 1960. Indeed it is noteworthy that the position of the 'Systems' group is quite distinct from the ideologies adopted around this time by such national groups as the French Groupe de Recherche d'Art Visuel, the German Zero Group and the Italian Gruppo T, centred as they were on a commitment to experimental research with basic forms and an exploitation of the types of instability generated by kinetic mechanisms and optical effects. Even an artist like Jeffrey Steele, who was in the early 1960's to some extent involved with the 'New Tendency' groups and has in the past been classed as an 'optical' painter, is now in no doubt that the 'rigorously programmed' works of this period incorporated the optical element merely as 'side effects'. In the polemic which Joost Baljeu undertook against the 'nihilism' of the Zero Group and the Groupe de Recherche d'Art Visuel[11], the weight of the English constructive artists would have rested, unambiguously, on the Dutch side.

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[8] *The anthology has recently been republished by Faber & Faber.*

[9] *Cf. her Editorial in Axis, Summer 1936.*

[10] *Articles and Notes by Mary and Kenneth Martin and Anthony Hill are included in* Studio International 1969, *Vol. 178, No. 914.*

We therefore arrive at a stage where the spectrum of different tendencies among the English constructive artists, though wide, at the same time excluded many of the more radical, and at the same time theoretically less strong, European departures. What the English artist could discern in positions as different from one another as those of Biederman, Max Bill, Baljeu, Kenneth Martin and Anthony Hill was a common rigour in defining the critical implications of their practice as artists, and a common determination to remain within the area of the Modernist problematic: this did not necessary imply reaching back as far as Cezanne (as in the case of Biederman), but in almost every case it involved a desire to bring into play the complexity of issues which had constituted the richness of classic constructive work. Joost Baljeu's scholarly interest in the theory and practice of Van Doesburg and Anthony Hill's penetrating investigation of Mondrian's structures both illustrate this desire.[12] The contrast with the reductive position of the Groupe de Recherche d'Art Visuel, which may stand as the exemplar of the 'New Tendency' group, hardly needs to be pointed. Whereas the manifestoes of the GRAV signalled the need for a new 'cleavage' with the Modernist tradition, in which the constructive vocabulary was to be entirely stripped of its ideological, transcendental and idealist connotations, the English constructive artists were able to work within a much wider matrix, rejecting none of the constructive traditions programmatically but accepting the plurality of types of practice both in diachronic and in synchronic terms.

It is with the presentation of this particular context that the second attempt to circumscribe the field of the constructive aesthetic comes into view. In 1968 Anthony Hill published a collection of essays entitled *DATA—Directions in Art, Theory and Aesthetics*, which explicitly recalled the *Circle* collection of 1937 in drawing its contributors from a wide range of artists, scientists and other critical theorists in England and other parts of the world. Where *Circle* had displayed the unbridgeable gulf between the foreign exiles and the native artists, and *Art as the Evolution of Visual Knowledge* had set down one man's immensely impressive reading of the Modernist tradition, *DATA* was pre-eminently a forum for the airing of critical theory. In bringing together material written by artists as divergent as Vantongerloo, Vasarely and Biederman, it helped to promote that consciousness of the constructive aesthetic as a *plurality of genetically related positions* which provides the soundest basis for advance in the present historical situation.

It was in the next year (1969) that Jeffrey Steele organised the 'System' exhibition of work by English artists for the Amos Anderson Museum, Helsinki. The informal grouping of artists who took part in this exhibition has been the main component in the present 'Systems' group, and it is worth detailing as a way of closing this historical section the different affiliations within the constructive tradition which several of these artists make manifest. Jeffrey Steele himself, as has been mentioned, was associated with European optical and kinetic painters in the 1960's, but has described himself as increasingly interested in 'theory of syntax in art and its implications' from 1969 onwards. Both John Ernest, who has made constructions exclusively since the mid-1950's, and Gillian Wise, who first became aware of Constructivism through Biederman in 1958, have been close associates of Anthony Hill. On the other hand, both Peter Lowe and Colin Jones, who collaborated together in the 'Inventions' exhibition at the AIA in 1963, studied under Kenneth and Mary Martin at Goldsmiths' School of Art.

It would be possible to multiply these various connections with relation to other members of the group, though this is scarcely necessary to establish the basic point that the 'Systems' group has clear, though divergent, affiliations to different figures within the English constructive movement. The one point which remains to be made is that which concerns the influence upon the group of Post-War American painting, an influence which, it has been suggested, is most pronounced in the cases of Michael Kidner, Malcolm Hughes and Richard Allen. Perhaps it would be useful to state first of all what has attracted these painters to the constructive tradition: the answer, without any doubt, is the attraction of systematic procedures based upon an order which is not necessarily apparent in the final work. But if the Post-Cubist reduction of American painting did not succeed in providing these painters with the kind of working procedure which the English artist—less convinced than the American of the supreme value of what Robert Motherwell calls 'venturesomeness'—prefers to follow, it did at least offer an entirely new sense of the possibilities of scale and the realities of perceptual stimuli. The grafting of American pictorial formalism on to English stems which was a feature of the 'Situation' exhibition of 1960 has had its effects in the careers of such younger painters as Bernard Cohen and Robyn Denny. But the much more problematic and original juncture between an American sense of perceptual and formal immediacy and a European basis of rigorous systematic procedure has surely not been manifest in English art up to the time of the present exhibition.

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[11] *Cf. 'Public letter to the Groupe de Recherche d'Art Visuel, Paris,' in* Structure, *Fourth series, No. 2, 1962, pp. 49-50, and 'The Constructive approach today', in* Structure, *Sixth series, No. 2, pp. 45-49.*

[12] *Cf. 'Art and mathesis: Mondrian's structures', in* Leonardo, *Vol. 1, No. 3, 1968.*

Up to this point I have been concerned with two central themes: on the one hand, with the variety of uses of the concept 'system' in the Modern Movement, and, on the other, with the specific development of a 'constructive' tendency in the English art of the present century. In the first case, I emphasised the divergence of the various paths of Modernist art, beginning with the disjunction of the two indissoluble features of Cezanne's creative enterprise. Cubism, Dadaism and Constructivism—to mention only the initially divergent movements—all represent different reactions to the problematic posed by Cezanne. And it is no criticism of the theory and practice of, say, Picasso, Tatlin and Van Doesburg to suggest that they were only proposing *partial* solutions to this problematic. It was, after all, absolutely necessary at this stage that the logic of Cezanne's position should be extended through a series of pragmatic realisations, and the historical position of the generation succeeding him made it inconceivable that the delicate balances of his system should be maintained. Yet, if this aspect of my survey has revealed a parting of the ways, the second section has demonstrated the existence of a compensatory process. Aspects of the Post-war situation like Biederman's reinvocation of Cezanne, the growing interest in mathematical systems characteristic of the Swiss Concrete artists and finally the junction of American Post-Cubist formalism with systems research—all of these tendencies represent a closing of the gaps which gaped so wide in the early part of the century. My contention would be that we are now able at least to envisage the possibility of a coherent theory and practice of the plastic arts, based on a synthesis of the divergent propositions of the Modern Movement. And my contention would also be that the English constructive artist, whose very conservatism has kept him from the extremist logic of American formalism and European 'New Tendency', is particularly well placed to attempt this synthesis.

In this specific context, the interest of the activity of the 'Systems' group is surely clear. For the unity of the 'Systems' group does not lie in any commitment to ideological activism in the Futurist pattern, or in the kind of programmatic theory of art that Van Doesburg would have wished to impose upon the De Stijl group. It lies precisely in the admission that, where a number of constructive artists have immediate affiliations to one or other modernist tradition, there is interest and utility in discussing how these various 'systems' may be brought within an overall synthesis: and, above all, in preparing an exhibition where there can be the mutual enrichment of various kinds of systematic procedure carried to their fullest point of development.

In the pages which follow, each of the contributing artists will discuss in detail the theory of his own project, and illustrate the system or systems brought into play. My own role seems to be not so much one of duplicating this material with specific discussions of the work in question, as of providing some more concrete evidence of the kind of 'overall synthesis' which I have invoked. There can be little doubt that, if such a possibility exists, it is one that cannot be realised without the establishment of a *critical context*. But it is equally clear, in my opinion, that this context can no longer be provided through reference to the various stylistic and formal paradigms of the Modern Movement. However important the examples detailed in the earlier part of this introduction may be, they must be shown to be relevant simply as *instances* rather than as *stylistic absolutes*. We must surely go right outside the language and the metalanguage of Modernism in order to establish our contemporary viewpoint of the plastic arts, though this viewpoint will necessarily include in its field of vision the varying theories and practices of the Modern Movement.

It is here that we can observe the relevance of Anthony Hill's prescription for 'the scientific study of art'.[13] He maintains that this endeavour 'ought not to be restricted to laboratory aesthetics (studies of eye movements, colour preferences etc.) but should encompass the kind of approach indicated by Peirce'. The reference to Charles Peirce, the American pioneer of semiotics, is highly significant. It has been a characteristic of the reductive procedures both of European artists like the Groupe de Recherche d'Art Visuel and of Americans like the 'Anonima' group to assume that the possibility of a scientific, objective view of art depended upon the correct analysis of perceptual and psychological processes. Yet any such view is surely contingent upon the very questionable proposition that the *meaning* of a work of art can be explained in terms of the categories of Gestalt psychology, statistical distribution of elements etc. If the members of the 'Systems' group are quick to express their indebtedness to such 'scientific' formulations as Ostwald's colour system, this does not in any sense imply that their works are scientific in the sense that Ostwald's formulations were. Just as criticism of Seurat's *pointilliste* paintings must remain essentially distinct from knowledge of Chevreul's colour theories, so the criticism of any plastic work of art—figurative or non-figurative—must be based on other considerations than those of its experimental or scientific value. In short, the claim that a work *demonstrates*

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13. Cf. 'A structuralist art?' in 20th Century Studies, *No. 3, May 1970, p. 109.*

scientifically codified phenomena should not be taken to mean that it *validates* them aesthetically. It may be so validated, but that question can only be settled by invoking criteria of a different type.

My rider to Anthony Hill's statement would therefore be as follows. While admitting the significance of his 'notion that new data from the aestheticians (i.e. practitioners of scientific aesthetics) could and *should* become essential data both for the artist and for the users of art', I would imagine it to be an even higher priority that both these classes should approach the field of semiotics and related disciplines, since these branches of study are concerned not simply with classification but with interpretation of signs. And if we accept that semiology, or the science of signs, is itself a sub-division of the field of linguistics, then we are confronted with a critical imperative to devise, from the study of language, a new metalanguage.

Undoubtedly the first problem that arises here is that of the specificity of the new metalanguage. Does not the approach I have indicated lead to a form of criticism that neglects the specifically plastic character of the work and impoverishes it by reducing it to the condition of a 'text'? Before this objection can be answered, it seems worthwhile to consider the problem from a somewhat oblique angle. Among the various 'systems' or views of systematic procedure detailed in my survey of the Modern Movement, only one—that of Theo Van Doesburg—was in any significant way 'linguistic' in character. Van Doesburg's 'Elementarism', the doctrine whereby forms of plastic expression in the pictorial, sculptural and architectural fields were all reduced to an 'elementary basis' in the rectangle, can be called linguistic in the sense that it presents the reader with a specific code, or set of formal paradigms, and invites him to see the realised work as an articulation of this code. Van Doesburg has, so to speak, declared his vocabulary, and expects his public to view the work as an amalgam of distinct terms deriving from this vocabulary.

Van Doesburg's 'Elementarism' has an honoured place in the spectrum of theories which evolved during the Modern Movement. It bears a central relationship to the tradition of Cubism and, beyond Cubism, to Cezanne. But, once we start to look at it in strictly relative terms, with a view to discovering a critical metalanguage based on the principles of linguistics, its inadequacies are only too clear. And it is precisely because of the *specific* nature of the code that Van Doesburg's schemata come to seem either banal or tautologous. Maintaining and intensifying that sense of painting, or plastic expression, as an aesthetic pacemaker, which had virtually dominated European art since the Impressionists, Van Doesburg reduces both sculpture and architecture to the measure of the rectangle—the supremely visualised basic form. But in giving such priority to this easily assimilated notion, he neglects one of the fundamental notions in linguistics: it is not the terms themselves (phonemes or units of syntax) that are significant so much as the relationships between terms—the characteristic patterns according to which they combine to establish meaning. In seeking to *visualise* his elementary bases, rather than describing their modes of realisation in the finished structures, Van Doesburg not only fails to provide a critical method for analysing plastic works in general: he actually fails to make explicit the systems which operate in his own creations.[14]

This example serves to clarify the point which was raised earlier. We might say that, in so far as a metalanguage which purports to describe the plastic work as a linguistic system confines itself to introducing *specifically plastic terms*, it ignores what is properly linguistic in that work. It is not the recurrence of the rectangle in Van Doesburg's work which needs to engage us, but the series of relationships between rectangles and the extent to which those relationships can be adequately formalised.

The previous conclusions may appear self-evident. But the possible shift in critical pre-occupations which they presage is perhaps not appreciated sufficiently—in this country, at any rate. It has been a common phenomenon in the history of Western Art for one particular art to impose its characteristic metalanguage upon another. Examples of the transference of plastic to literary terminology might be found in the cases of Symbolism and Imagism, while the contrary process has taken place in the case of literary and pictorial Surrealism. Even where no such clearly identifiable transfer has taken place, the exchange of terms on a piecemeal basis has continued to occur, with the result that we now have a series of functionally distinct metalanguages—in the sense that they are applied to distinct groups of artefacts—which turn out to be aggregates of terms, some of which are specific to the particular artefact and some of which are specific to another type of artefact. This predicament cannot be divorced from the condition of the arts themselves, as if it were possible for a vital current of artistic achievement to continue unaffected by the disarray of the terminology employed to describe and evaluate it. Or, to put the proposition in a more modest form, it cannot be divorced from the condition of the arts at the present time, when the setting up of a context for artistic activity seems in some respects a requirement more insistent than that for the works themselves.

This contentious preamble may serve to introduce the final section of my introduction, which is based upon the presupposition that such a context is indeed required. Although it refers in the first instance to the 'Systems' group, it is not, by its very nature, exclusively confined to their work. It would be accurate to say that the very heterogeneity of the attitudes and objects involved makes it necessary to extend the range of applicable terms far beyond what would have been necessary in an individual or

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14. In fairness to Van Doesburg, it should be added that, in his manifesto on 'Concrete art', published at Paris in 1930—the year before his death—he pointed towards the conjunction of art with mathematical structure which was later to become a feature of the work of the Swiss Concrete artists (Bill, Lohse etc.).

indeed an ordinary group exhibition: and, by that same token, this range of terms acquires more general significance.

The critical context which I shall sketch depends upon a small number of first principles, which must be stated at the outset. Firstly, the terminology applied should not be *metaphorical* but *descriptive* (it should of course be emphasised that this implies *the disclosure of whatever structures are there* and not a mere naming of superficial constituents). Secondly, it should be *descriptive of the work* rather than *of the process of making*. Thirdly, it should abandon the requirement of a specific relation to the object in its concrete realisation in favour of a firm foundation in semiology and linguistics. The last point may seem to overstate the claim which was made in the last section. But it may perhaps be more acceptable if presented as a point of procedure. The fact that we can only know the work of art in terms of its concrete, and perhaps unpredictable manifestations, need not in any way conflict with the principle that we can only *understand* it, structurally and genetically, from a firm theoretical basis.

One final principle must be established before the terminology is introduced. As Jean-Louis Schefer's remarkable *Scénographie du tableau* establishes beyond doubt, the application of linguistic schemata to pictorial works of art is an exceedingly complex enterprise. Even though Schefer had to reckon with a work of the Renaissance and consequently with codes such as those of perspective and culture which have no counterpart in the contemporary geometric work, his study illustrates the crucial fact that the pictorial work—any pictorial work—is *surcoded*. It cannot be analysed and, so to speak, dissected without remainder. It does not have the form of a simple proposition, and consequently cannot be satisfactorily understood through the techniques employed for analysing a proposition. Its significant units of sense might be discovered in many cases not in the reduction of spoken language into patterns of phonemes, but in the kinds of relation between semantic and visual displayed in the paragraphing of a passage of prose. In other words, they might reside not in the *microcosmic* scale of irreducible units, but in the *macrocosmic* scale of aggregated units.

Clearly the first term in any critical terminology applied to the work of the 'Systems' group is the word 'system' itself. In my opening section, I suggested that the various divergent tendencies of the Modern Movement gave rise to a number of different 'systematic' procedures. A survey of the individual texts included in this catalogue will show that there is an equally wide divergence among the artists of the 'Systems' group, as far as the systematic procedures involved in their work are concerned. One need go no further than to cite the case of Michael Kidner, whose procedure entails the systematic derivation of a two-dimensional schema from a three-dimensional object, and compare it with that of Jeffrey Steele, who formulates a 'critical path' of creation in strictly mathematical terms. Yet this kind of disparity need not discount the fact that, to the critic or spectator, the 'system' of the work is not necessarily to be equated with the systematic procedure which determined its creation, any more than the biographical details of the process of fabrication can be said to establish the way in which the work will affect the spectator emotionally.

We therefore require a purely normative sense of the term 'system', appropriate to the activity of the spectator. And this sense is provided in the opposition system/syntagm which is derived from structural linguistics and forms one of the cornerstones of semiology. According to Roland Barthes, any assemblage of signs may be envisaged as existing on two levels, that of the elements *in absentia* (what is signified) and that of the elements *in praesentia* (what signifies). Thus, in the case of a building, for example, we would have before our eyes the 'sequence of details' constituting that particular architectural instance, and be able to relate them to the paradigms of like details which constitute the vocabulary of architecture. The *syntagm* would be before us, as a combination of signs in real space, while the *system* would be the total range of paradigms from which those signs were drawn.

This distinction becomes fruitful for the analysis of works of constructive art if we recall that we are not simply dealing with a basic code, as in Van Doesburg's programmatic example. Even the most austere work is likely to present us with units of varying kinds, according to where we see the discontinuities and relationships. Indeed, part of the subtlety and attraction of a constructive work is due to the fact that we can never analyse it to the point where each element is absolutely discontinuous. The paradigms of geometrical form and primary colours, for example, interact in Neoplastic work. Here we arrive at a possible explanation for Geoffrey Smedley's equation between the systematic and the 'elusive'. Quite apart from any evidence of the systematic procedures which determined the creation of the work, we are bound to read the work as it stands: that is to say, we are confronted with instances of simple codes which, by virtue of their intersection and redundance, resist the spectator's attempt to disentangle them.

An obvious example of this process can be found in the 'optical' effects which have a preponderant role in the work of Richard Allen, and can also be found in the other members of the group. The 'interference' phenomena which he brings into play are caused by the intersection of two extremely basic codes, one involving formal repetition and the other the alteration of colours. Yet the interest of the work resides precisely in the fact that we cannot read it in terms of a 'system' of paradigms. We are forced to concentrate on the problematic effects which occur through the juxtaposition of terms in real space.

This example suggests an introduction of the distinction which Jakobson makes between *metaphor* and *metonym*: between non-linguistic forms of discourse which emphasise the *systematic* order (metaphor) and those which emphasise the *syntagmatic* order (metonym). Jakobson consigns to the former, in which associations by metaphorical substitution are predominant, such departments of art as Surrealist painting and Symbolist poetry, while the latter would be characteristic of such forms as the epic or the historical film. But we could apply the distinction in much more direct terms to a division which is most evident among the members of the Systems group. In the case of Richard Allen, as already mentioned, and also, unquestionably (though for different reasons) with Peter Lowe, Colin Jones and James Moyes, it is the syntagmatic order which preoccupies us. In the case of Jeffrey Steele and David Saunders, on the other hand, the syntagmatic order only serves to lead us beyond the visible to the invisible, or systematic level. If we can accept that in these cases there is a disproportion between simplicity of the system and complexity of the syntagm, and *vice versa*, then we must also accept the possibility of a carefully maintained balance between the two. Indeed the work of Gillian Wise, with its frequent representation in two dimensions of connections which have (demonstrably) been made in three-dimensional space, seems to provide the epitomy of this balance.

The broad distinction made above can be amplified in several different ways. Obviously an important factor to be taken into account is the overall relationship of (positive) form to (negative) space in the works under consideration. Where, as with Colin Jones, Peter Lowe and James Moyes, the forms interlock so closely with one another as to render any spatial support negligible, the syntagmatic order is naturally predominant. Where, on the other hand, the detached forms of David Saunders or the fine linear accents of Jeffrey Steele's 'Syntagm' drawings are divided by sufficient space to emphasise the presence of a 'supporting' space, we are impelled to view the rationale of their juxtaposition as existing elsewhere, in the systematic order. This distinction may, once again, be linked to a question of working procedure. Colin Jones, for example, would value the concept of a systematic process which is modified in the actual construction of the work, while Jeffrey Steele would tend to see decisions taken arbitrarily in the course of creation as an element of Mannerism or illogicality (not necessarily to be devalued because of that). Let it be emphasised once more that the orientation of the spectator towards the systematic order does not necessarily mean that he must uncover the procedures of the work's creation, or be denied the satisfaction of discovering meaning. David Saunders is insistent that 'complex mental activity' can be generated by a collection of signs even if the observer is totally unaware of the 'code' according to which they have been assembled.

From this basic semiological distinction between the syntagmatic and the systematic order, we can proceed to a more specialised notion of system, which provides an additional analytic tool. In his discussion of the *Morphology of the Folktale* by the Russian formalist Vladimir Propp, d'Arco Silvio Avalle suggests the following apparatus of critical terms:[15]

A. SYSTEM as a heuristic tool
B. STRUCTURE as the way SYSTEM is REALIZED in individual concrete OBJECTS
C. the individual work as a 'microcosm' or concrete REALIZATION of the SYSTEM

The advantage of this particular formulation is that it is devised for critical analysis rather than for linguistics proper. Avalle shows that Propp pursued his comparative investigations of Russian folktales with the aid of the concept of a 'unitary schema of composition'. Although initially he was assuming that this schema was historical in origin (i.e. that there was one folktale or arch-folktale from which all others developed), his later considerations implied that it simply represented a 'heuristic tool' —i.e. a hypothetical schema in terms of which the relations and functions of existing folktales became clear.
There is no need to stress the point that constructive or 'systematic' art is particularly conducive to the kind of analysis which Avalle defines. Here again it is not necessary for a *system* to be embodied in any particular work, or in any particular working draft, for it to serve as a heuristic tool in the elucidation of a series of individually realized 'microcosms'. This particular exhibition, which deliberately concentrates on one single project for each artist rather than displaying the diachronic succession of his works, is not the most appropriate occasion for an investigation of the 'Systems' group in these terms. But there seems no doubt that analysis of this kind, concentrating on unifying notions like the persistence of different forms of symmetry (bilateral, topological etc.) throughout a series of works, could extend our knowledge of the 'systems' open to the constructive artist.

The reference to Propp also brings in an additional element. All the terminology which I have employed up to this point has been concerned primarily with static objects, or rather with phenomena which, for the purposes of analysis, are considered as existing outside time. Yet a large proportion of the works included in this exhibition are, because of their environmental nature, dependent upon the notion of sequence. Although it could be argued that all works incorporate a time dimension to the extent that their 'reading' is not a simultaneous operation, it is surely clear that a work incorporating, say, four separate panels, which must be seen in a temporal order, uses time as a structural element in a way that the unified work need not. The achievement of Propp has been precisely that of formalising narrative functions, in other words of

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[15] *Cf. 'Systems and structures in the folktale', in* 20th Century Studies, *No. 3, May 1970, pp. 67-75.*

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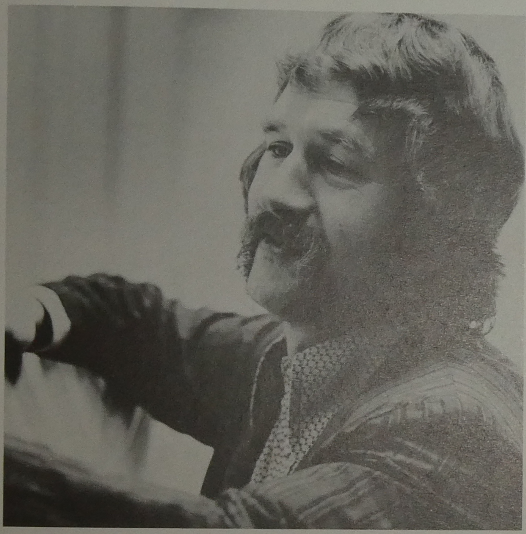
[15] *Cf. 'Systems and structures in the folktale', in* 20th Century Studies*, No. 3, May 1970, pp. 67-75.*

It should be made clear that this is not tantamount to reviving the old principle that 'every picture tells a story', and so introducing an improper confusion between what is proper to literature and what is proper to the plastic arts. The analogy which I am suggesting is not between the content of literature and the content of the plastic work, but between the functions of narrative (not of any particular narrative, but of an aggregate of narratives), and the formal sequences of the plastic work. It is the very fact that Propp has reduced his material to so schematic a form, which makes his findings transferable, though it may incidentally be a reason for the inadequacy of his techniques in analysing any but the simple of literary *genres*. And of course Propp's work is not the only example of a reduction of literary sequences to formal patterns. We have, to take the most famous example of all, Aristotle's analysis of the tragic drama which begins with the capital distinction between the beginning, middle and end of a dramatic process. It is still a subject of debate among classical scholars whether Thucydides' *History* can be taken to exemplify the dramatic structure (*hubris* being followed by *ate*) formalised by Aristotle, and whether such an admission would constitute a criticism of his integrity as a historian. In the same way, one can anticipate endless debate on the subject of whether certain sequential structures are present in a work of constructive art, and, if so, whether the fact that they have been defined in relation to literature constitutes a slur on the integrity of the artist.

The answer, of course, lies in a shifting of the problem to different ground. To draw a rigid antithesis between Aristotle's structures and 'historical reality', or between Propp's structures and 'plastic reality', is quite false, since it excludes the possibility that, on the one hand, such structures may have a real basis in mental dispositions and, on the other, that neither history nor the plastic arts can be envisaged except in so far as they have been given meaning by man. Surely the most suggestive lesson of recent literary criticism based on Formalist or Structuralist techniques is the implication that we must investigate the bases of our rhetoric? The grammatical figures which have been pushed to the most obscure corner of that universally despised repository, the Latin Grammar, are being rescued from the effects of a prohibition that, in England at any rate, still weighs heavily upon them, and it can be seen that such concepts as *metonym*, *chiasmus* and *litotes* (to take a few at random) denote, or approximate to, universal structures of communication. Even a scientific enterprise which proposed as its object the liberation of Western man from the matrix of this Graeco-Roman system could only do so from a point at which all its aspects were understood and thus relativised.

In this context the constructive tradition has a new, and perhaps unexpected role, which hinges upon the persistence of an inclination towards 'Classicism' which has not recurred so consistently in any other branch of literature or the arts. Even if it is necessary to dismiss once and for all the notion that the visualised geometry of the Constructivists represents an absolute and sufficient Classical vocabulary, it is obviously still permissible to use geometry to express structural relations and patterns which are inherent in the human disposition to the creation of signs. For example, the presentation of mathematical figures like the Moebius Band (as in the case of John Ernest's work for the present exhibition) may be equated with the mythical images of eternal recurrence in the figures of Sisyphus and Ixion. Thus the 'Systems' group offers the possibility of a critique of cultural forms, based on the comparison between new plastic structures and implicit principles of linguistic usage. And, incidentally, it may be possible to recover on this ground that creative interchange between the fields of literature and the visual arts that has been so lamentably lacking in English culture over the past forty years.

Richard Allen



Born in Worcester 1933
Studied at Worcester School of Art and Bath Academy of Art, Corsham
Commonwealth Scholar in Fine Art 1966
Artist in Residence, University of Sussex 1967

Now teaching at Brighton College of Art, Central Polytechnic School of Architecture and London College of Printing

One man exhibitions:
1967 University of Sussex, Brighton
1971 Angela Flowers Gallery, London

Some recent group exhibitions:
1966 Kinetic Art, Herbert Art Gallery, Coventry
1968 John Player Biennale, Midland Group Gallery, Nottingham
1971 Matrix, Arnolfini Gallery, Bristol
Art Spectrum London

I began working seriously in 1957 and, like many of my contemporaries in college at that time, I moved through objective studies towards more subjective interpretations from nature and from the immediate environment. Gradually there was an increasing tendency to reduce the more arbitrary subjective elements in the work and to experiment with sets of simple formal rules which would have a predetermining effect on the basic construction and resultant form for a series of paintings.

Stronger evidence of a natural disposition towards structure and system occurred during a series of poster collage works (1961-2) in which grids of painted and incised lines eventually held the unordered collage material in close control within a predetermined visual structure.

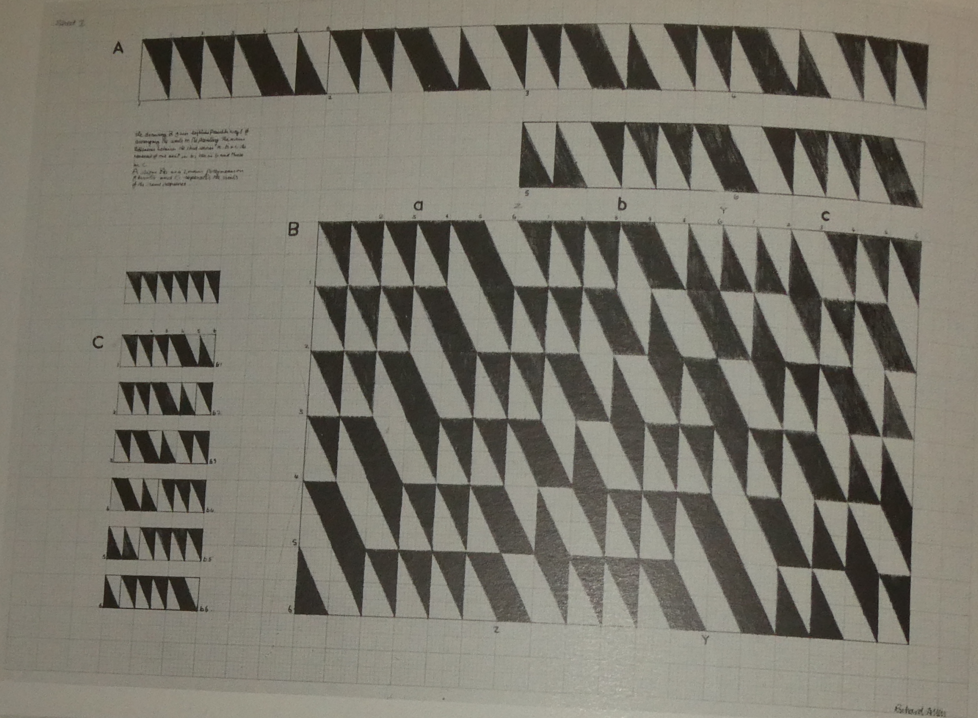
The advent of Op art in the 1960's, and an interest in certain perceptual phenomena associated with that movement, led me to pay some attention to the general theory of interference phenomena and in particular its visual aspects in some of its applications in metrology. Although the more obvious visual aspects of interference phenomena do not occur in the recent work, the system and resultant paintings have their origin in that encounter. The elements I work with were not chosen at random but were established during the experience of several working processes over a number of years. The innate necessity to work creatively within a personally acceptable range of formal limitations has been an important underlying motivational condition of development in the work.

There is much scope for growth and change both in the form of media and in elemental make-up. The choice within the broad concept of 'Systems' seems to be unlimited.

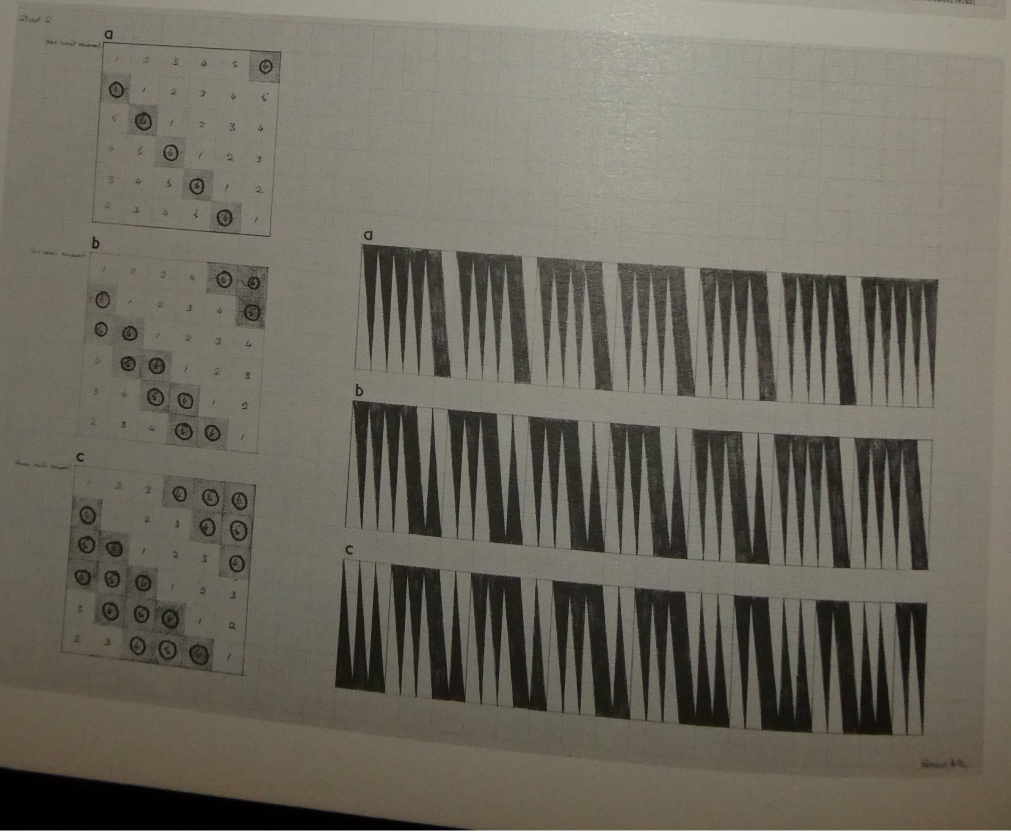
Project for the exhibition

As the exhibition is to travel, the project has been designed with certain limitations in mind: dismountability, transportation, varying size of galleries and access etc. The work consists of six separate canvas units each 7 ft. by 3 ft. 6 ins. They are intended to be hung side by side and edge to edge to form a painting 21 ft. by 7 ft. One, two or three of the units may be inverted. The drawings provide a key to 18 different assemblies of the units based on simple rotational permutations.

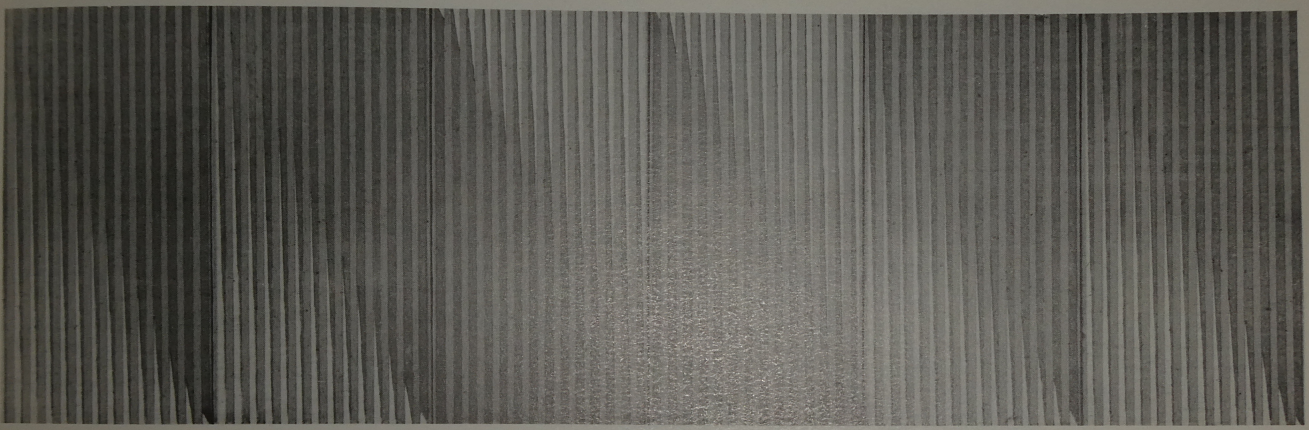
It is also possible to reduce the number of units or to split them into two or three related groups. There are many other possibilities available through varying the relative positions of the inversions at the beginning of a series. Also the units may be related with varied orientations.



Richard Allen, drawing, Three sets, eighteen variations

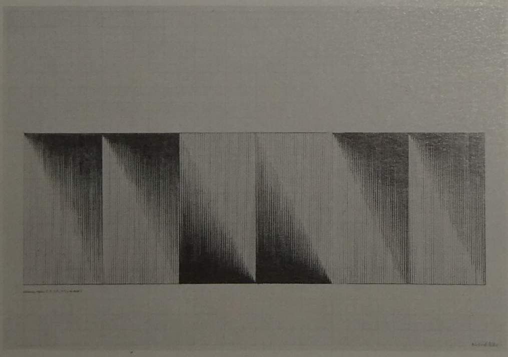


Richard Allen, drawing, Unit inversions



Above:
Richard Allen, painting to scale
⅙ (14" × 42"). Actual size
7' × 21'

Right: *Richard Allen, drawing*
b3/345612



Elements

1. Two colours (corporeal) A & B.
2. Support. C.
3. Colour interaction (non-corporeal) at the conjunction of A & B and frequently occurring in C in the form of simultaneous contrast effect in complementary colours with equalising tonal adjustment thereby closely relating A, B and C.
4. Linear construction: intersection, expansion and contraction of straight parallel lines generally having their basic formal origin in visual interference phenomena, in which the relationship between two elements additively or subtractively produces an additional third element.
5. In close relation to 4: measurement and division along axial and/or peripheral constructs at the inception of a particular work.

The application of system can work at two levels in the paintings:
1. within the basic elemental construction.
2. within the broader unit construction.

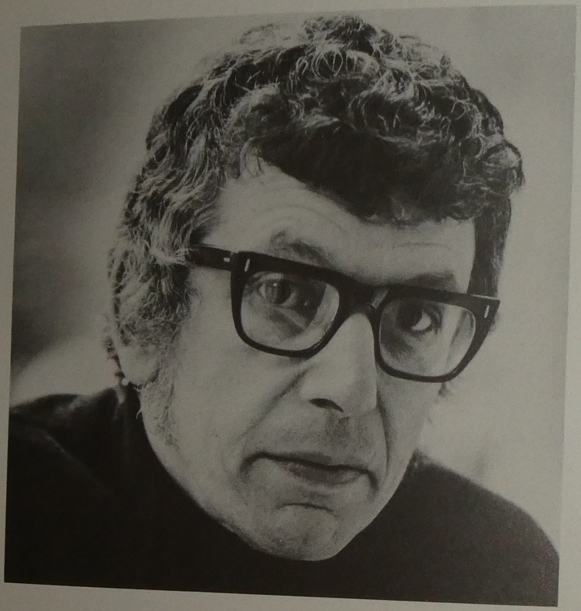
System and creative process

A. Subjective formal elements.
Evolved during and carried from working experience, continuing engagement and development as an artist predisposed towards a consciousness of process and order, a concept of a certain approach in working.

B. System and process.
The system is the subjective choice of the artist, but may be conditioned by the nature of A, to which it could bear a direct formal relation, or be consciously opposed, or from which it may derive a deliberately randomising action. The system having been 'set up', the process is self-determining.

C. Output and feedback.
The product of A and B at C is information, a body of material which may be accepted in total, added to, subtracted from, fed back through the same or another system, or used to modify the system just used. These alternative choices, and the decision at what stage to break in and display something as art, are the subjective decisions of the artist.

John Ernest



Born in Philadelphia, USA, 1922
Lived and painted in Sweden and France from 1946
Moved to London in 1951
Studied sculpture at St Martin's School of Art 1952-56 and made constructions exclusively thereafter
Has taught at Bath Academy of Art, Corsham

Now teaching at Chelsea School of Art

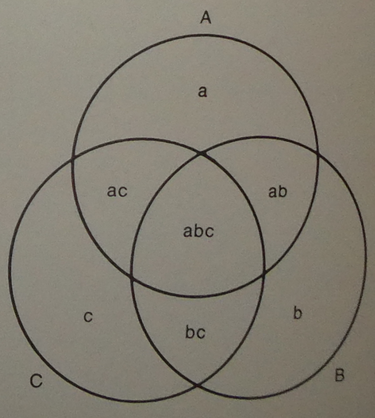
One man exhibitions:
1964 Institute of Contemporary Arts, London
Queens University, Belfast

Some recent group exhibitions:
1967 Unit, Series, Progression, Arts Council
Constructions, Arts Council (tour continues)
1968 Documenta 4, Kassel
Relief/Construction/Relief, Museum of Contemporary Art, Chicago
1971 Four Artists: Reliefs, Constructions and Drawings, Victoria and Albert Museum, London
Matrix, Arnolfini Gallery, Bristol

Why should a model of a negative Moebius Strip be in an exhibition of systematic art? Perhaps telling how this object came to be made, and of the thoughts that lie behind it would help provide an answer.

Anyone who looks at popular books on mathematics will come across pictures and descriptions of the Moebius Strip, the Klein Bottle, or other examples of one-sided surfaces. Years ago when I first became interested in mathematics I came across such pictures, and though I was shortly to see some rather beautiful works of Max Bill which were based on these surfaces, I did not at that time relate these interests directly to my art. But my interest continued and grew into a sort of obsessive curiosity about the nature of models, and indeed, of any kind of representation.

No artist need justify an interest in representation. Most of us have speculated at one time or another on the limits of *trompe l'oeil*, or puzzled over odd pictorial conventions which in other cultures have passed for visual reality. But I suppose it is not an immediately obvious step to compare an iconic sign like a portrait to a sign that is a visual analogue for some abstract structure. An example of such an analogue would be the logic diagram attributed to Euler in which three intersecting circles, A, B and C, separate regions of the plane into those enclosed by any one, or any two, or all three of the circles, paralleling the logical notion of three sets having elements in common or distinct from one another. Like the portrait this too is an iconic sign. But what is it a picture of? What are its rules of usage?



A portrait is a sign which operates on familiar ground and its rules seem understandable. We agree the reading of a picture of a person's head because it reminds us of direct visual experience of the world. It would be difficult not to agree. Furthermore it someone were to say that a head by Rembrandt really represents a large prime number, or a logic diagram, we would not agree, or perhaps look for some oblique form of symbolism.

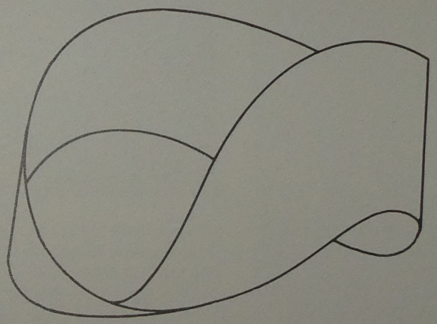
There is a class of signs appropriate to this purpose. Signs which do not call a thing to mind through a resemblance. What does a letter of the alphabet look like? A sound? Yet with such arbitrary signs we are well practised in the art of agreement. If someone says, 'Let *x* represent that Rembrandt head, or a large prime number', we instantly recognise the terms of the contract. But is there not a kind of resemblance at work here too? When something is represented by an arbitrary sign, it seems to me that that something is reduced to a state of singleness, and the sign too, however complex its appearance, has been reduced by its function to a state of singleness. Neither has any parts. We do not examine *x* to see how deep were Rembrandt's shadows, or of how many digits the prime number was composed.

If this resemblance is allowed, the unitary function of arbitrary signs tells us something about the way the representation of an abstract structure works: or at least those structures whose features or properties are discrete. The idea behind this is that given an entity with, say, two features, both of which are represented in a sign—and it does not matter how arbitrary the representation—the sign acquires structure. Two elements with a relation between them is a simple enough sign-structure, but it is enough to mirror the entity under consideration. If, for example, a thing is round and red, a red circle would give a reasonable picture. But if round is 'A', and red is 'B', then to say a thing is both A and B, gives a picture, albeit highly abstract, of the same structure. Verbalising a relation by calling it 'equal to', or 'both', or 'connected to', does not impede its function, and is only a more specific way of putting that which we tacitly understand. We quarry such relations from our normal experience of the world. Such qualities as, being adjacent in time or space, or of being continuous, or of being simultaneous, are relations we perceive every day and apply easily to quite other circumstances.

I do not mean to suggest that naming the parts and relations in a sign is the same as building them smoothly into an integrated image. But the distinction becomes less clear as the subject depicted becomes more abstract. And though we construct models, or untangle the meaning of analogy by calling on our intuitive understanding of relations, if we wish to go more deeply into our topic we are obliged to proceed analytically; to undo the binding and examine the separate parts.

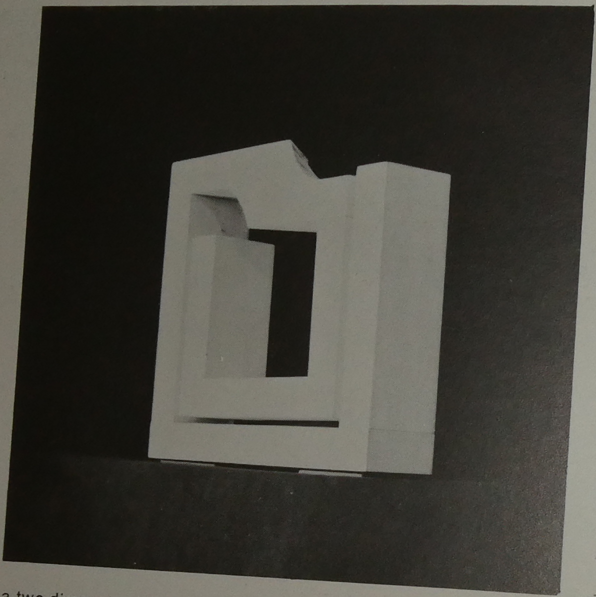
We make models easily and we can instantly shift the focus of our attention to accommodate a change in the conditions of representation. I need only say, 'Let one side of this page represent "off", and let the other side represent "on" ', to make a model of a simple binary structure. Seeing one side to the exclusion of the other becomes an analogy for the 'either-or' relation. But if you are asked to let the top of the page represent 'up', and the bottom represent 'down', a new model comes into being in which different properties of the page are used to constitute the sign.

One of the most intriguing things about models is that once a valid correspondence has been set up between the subject and its image, the model may reveal aspects of the subject not obvious to direct consideration. Surprisingly this is true even in such a formal discipline as mathematics. A diagram may be used as an empirical tool for discovering new properties in some conceptual structure. Or, by making its relations more readily available to the intuitive understanding, it may allow a deeper insight into the consequences of an idea.



A model of a Moebius Strip is rich in implications and rather unexpectedly dependent on what might be termed the 'natural' conventions of representation. The object itself is a fairly familiar piece of games lore. To make one, take a strip of paper, give it a half twist and join the free ends. If it were joined up without a twist the resulting object would resemble a section of a cylinder. How do the two objects differ? If you paint one side of the cylinder the result would be exactly as expected; one side, inside or outside, would be covered with paint. If you do the same to the Moebius Strip, you will find that both sides have been painted. Similarly, if you drew a pencil line along the centre of the strip, parallel to an edge, it would run on both sides of the strip before returning to its starting point. Having drawn such a line, some will recognise the party trick in which if the Moebius Strip is cut apart through this line, it does not fall into two separate pieces but opens into a longer continuous band.

Experiments like this are usually given as the reason for calling the Moebius Strip one sided. The term is misleading. It is a model of a mathematical surface which is by definition composed of points in



a two-dimensional array. Since mathematical points have no thickness, nor length nor breadth, nor do they have any parts or features, the idea of being on one side or another of such a point is unclear, perhaps meaningless. Take as a model for such a surface a piece of paper; then a figure, like a circle, on it would really be embedded in the surface and should appear equally on both sides of the sheet. This would be so for the cylinder as well as for the Moebius Strip. One can make their difference precise by the following. Put an arrow on the circumference of the circle giving it a directional sense (clockwise or anti-clockwise). On a Moebius Strip this figure can be moved along the surface without lifting it, until it returns to its original position with its sense reversed, while on the cylinder, or any like surface, it is impossible to reverse its sense by such an operation. As a consequence the points of the surface of the Moebius Strip cannot be given a fixed orientation, and it is more properly called a non-orientable surface.

There are closed surfaces of this type: closed as a box is closed, or like the surface of a sphere. What sort of a thing does a Moebius Strip become if its boundaries merge? One of my first efforts at creative play with the model was an attempt to close its surface by adding more and more strips to its edge. I was delighted with the shapes I got but I did not succeed in closing it. Ultimately I was to find that this could only be done by allowing one part of the surface to intersect itself, as is the case for any closed non-orientable surface. This is hardly to be wondered at since such an object would be equivalent to a box, which though wholly sealed, did not separate inside from outside.

Adding strips to its edge makes it clear—and to me this was a surprise—that the Moebius Strip has only a single edge. I felt at that time that there was something vaguely similar about the line that could be drawn along the centre of the strip and the single line that comprised its boundary. I wanted to test this similarity by splitting the paper into two thinner strips and to compare this with cutting it along its centre. But paper is difficult to split (the obvious method of using two strips of paper to make the model had simply not occurred to me), so I made a thicker model and found on splitting it that there was considerable symmetry between the two operations: in both cases the strip opened up into a longer continuous band, one narrower the other thinner. The logical conclusion to the idea of making the model thicker is to make it out of a material that is square in section; as thick as it is wide. Carrying this process further merely returns the model to its original condition. I made a version by taking the cardboard sleeve of a fluorescent tube, flattening it to make it easy to join its ends, and then reopening it to its square section. Of course I could then see that it could be flattened along its other set of creases to make another Moebius Strip.

There comes a point in a chain of actions like that where one begins to wonder what one is really doing. I had assumed that I was examining the properties of a mathematical surface with an unusual connectivity. But I became increasingly aware that I was actually examining the properties of a particular physical object. Furthermore it became obvious to me that features, like the face of the surface, or its edge, came into being by a decision; that they were matters of definition. That I could, if I chose, disregard 'natural' analogy, and change the terms of the representation.

I returned to my experiments with the model in a different spirit. Now, looking at the 'magical' property of the Moebius Strip—that it could be cut apart along its centre line and remain in one piece—it was clear to me that this was a property of the physical object, the paper band, and not the unique attribute of a mathematical surface. That if it held true for a thin solid like paper it must also hold true for a more substantial solid. The only condition that need be fulfilled is that the new solid must have the shape of a torus (a solid with a hole in it like an American doughnut), of which the paper band is an example. I went on to make a number of maquettes using variations of the torus to demonstrate this idea, but this exhibition has provided the first opportunity to make a major version.

That is its background. The object itself: A square torus with a continuous slot cut entirely through its body in a closed curve to form a Moebius Strip. The torus remains in one piece.

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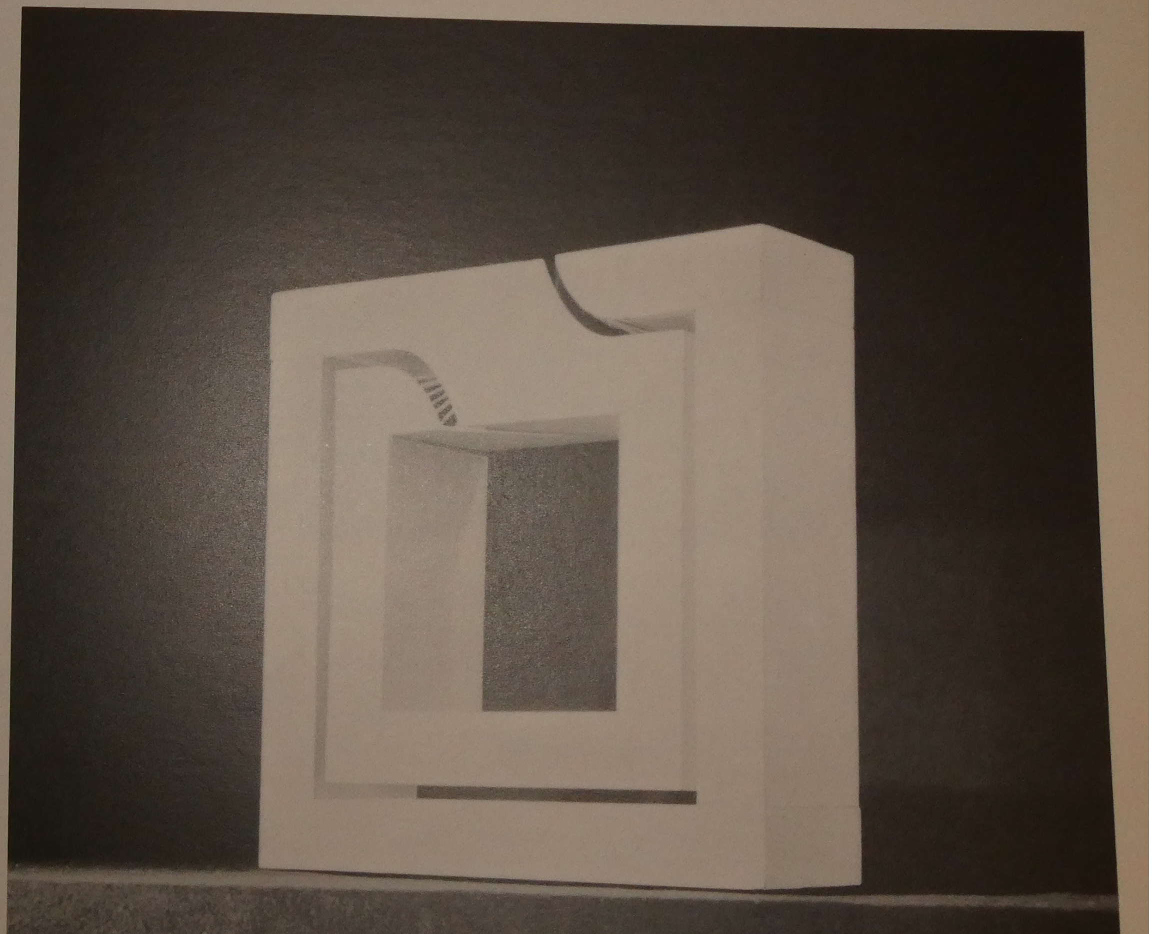
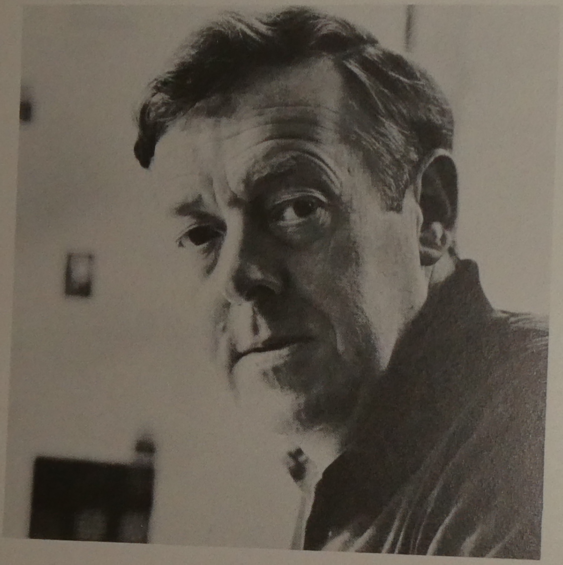


Malcolm Hughes



Born in Manchester 1920
Studied at the Regional College of Art, Manchester, and at the Royal College of Art, London

Now teaching at Chelsea School of Art and at the Slade School of Fine Art

One man exhibitions:
1965 Institute of Contemporary Arts, London
1967 Axiom Gallery, London

Some recent group exhibitions:
1967 Constructions, Arts Council (tour continues)
1969 System, Amos Anderson Museum, Helsinki
1971 Four artists: Reliefs, Constructions and Drawings, Victoria and Albert Museum, London
Matrix, Arnolfini Gallery, Bristol

'It seems remarkable that science, art, and mathematics have thus been moving in related directions, towards the development of what is, in effect, a mode of experiencing, perceiving and thinking in terms of pure structure, and away from the comparative, associative, symbolic method of responding mainly in terms of something similar that was already known earlier in the past. Such an approach is as yet in its infancy, so that there would be little reason, especially in a brief article of this kind, to attempt to evaluate the works of specific artists, scientists, or mathematicians with regard to this trend towards taking structure to be the essence of all experience. It seems sufficient at this point to call attention to the very widespread evolution in related directions in several different fields of human endeavour.''

I would like to discuss my attitude and work in relation to '*taking structure to be the essence of all experience*' under three headings:

1. *The conceptual/intuitive*
2. *The physical/objective*
3. *The perceptual/psychological*

These, for me, represent the three interacting and indivisible planes of meaning on which and through which the creative imagination operates. It is not suggested that at the creative level there is a particular causal order between these three levels, nor is there a hierarchial ranking in importance; rather, I would propose, an interpenetration between and beyond the parts—a dynamic, evolving totality.

1. The conceptual/intuitive

The structure of the concept cannot be divorced from the structure of the language in which it is expressed—the one *is* the other. One of the purest types of conceptual thinking, pure mathematics, is one with the symbology that expresses it. Any growth and extension of conceptual thought *is* a growth and extension of the appropriate language.

The traditional idea of the development of concepts 'through abstraction' (i.e. 'abstraction from'—the abstraction of properties and characteristics from empirical situations) has to be measured against the idea of concept formation by what is known as 'reflective abstraction'—to borrow a term from modern mathematical philosophy and logic. The latter is defined in terms of how we perform mental acts of structuring, ordering and co-ordinating, rather than according to an empirical standard.

The intuitive formation of concepts must always be seen in the context of usage. It is never a question of a 'one to one mapping' of immaterial concept onto, or into, material object (the artifact). The physical nature of the artifact determines its own methodology of concept formation and expression.

The interpenetration of these two planes of meaning—the essential paradox between the form used in expressing abstract concepts and the concepts themselves—is what uniquely creates the language of art.

2. The physical/objective

It is the attempt to realize in physical terms the conceptual structure that creates the structure of the artifact. At the physical level one is concerned with the finite, the specific—on this level the physical structure is the result of measurement and is determined by forces of an objective nature like gravity, compression and adhesion.

The awareness of the impossibility (and of one's inadequacy) of realizing at the physical level—with its limited dimensional resources—the full richness of the conceptual structure is very much a Sisyphus situation. It is this essential dilemma precisely that is the subject of one all-important aspect of creation.

3. The perceptual/psychological

Perception is thought of as being a structuring activity in its own right. One projects a psychological construct and, in a very real sense, one 'sees' what one is looking for. One finds what one expects and is familiar with.

Here Art has an important role to play by causing and enabling both change and extension, in an adaptive sense, to take place in the perceptual structuring of both external reality and the construction of the individual's total 'world view'.

Art is continually calling into question the very basic assumptions of the individual's 'world view' and the artist by providing new concepts and new constructs makes available, at both conceptual and perceptual levels, new and alternative models of this dynamic 'total reality'.

It must not be overlooked that often, although not always, the artist is, during the dialogue between concept and object, in the role of spectator of his own creation—he is his own midwife—and there exists a continuous feedback system that both extends and modifies (by a self-generating, self-regulating, cyclic activity) all three creative levels. This continual re-energizing can be presented as an 'open system'.

'Open systems also share the characteristics of negative entropy, feedback, homeostasis, differentiation, and equifinality. The law of negative entropy states that systems survive and maintain their characteristic internal order only so long as they import from the environment more energy than they expend in the process of transformation and exportation. The feedback principle has to do with information input, which is a special kind of energic importation, a kind of signal to the system about environmental conditions and about the functioning of the system in relation to its environment. The feedback of such information enables the system to correct for its own malfunctioning or for changes in the environment, and thus to maintain a steady state or homeostasis. This is a dynamic rather than a static balance, however. Open systems are not at rest but tend toward differentiation and elaboration, both because of subsystem dynamics and because of the relationship between growth and survival. Finally, open systems are characterized by the principle of equifinality, which asserts that systems can reach the same final state from different initial conditions and by different paths of development.'[2]

The use of the term 'open systems' points up the important shift that has recently taken place in our interpretation of the artists activity. Today the emphasis is placed upon the activity of the artist in the context of the behavioural sciences—i.e. the examination of living organizations relative to their physical/psychological environments.

The present tendency is to see the activity as no longer exclusively 'object orientated'—important as objects are—no longer primarily concerned with 'closed physical systems' but seen as an activity of 'structuring taking place in time'.

It is this ability to construct and develop new structures, the result of interaction between and beyond the three levels of creative activity, that enables the artist, by transcending the physicality of the artifact to extend and deepen experience and makes the activity itself available, as a behavioural model, to the whole of society. It is also via these three planes of meaning and operation, that the artist comes to terms with the 'fundamental need to assimilate both external and internal experience'. (David Bohm)

The necessity continually to renew and extend this 'total reality'—the 'world view'—is, in itself, sufficient justification of the role of the artist vis-à-vis society. In this situation one of the prime functions of the artifact is that it provides society with both model and trigger—enabling essential assimilation and adaptation to take place. And, once expressed, the truth of this 'total reality' remains constant—however, its interpretation, and the context of its usage, is continually developing and changing.

'We can no more "arrange" the natural numbers than we can the starry heavens; but just as we may notice among the fixed stars either their order of brightness or their distribution in the sky, so there are various relations among numbers which may be observed, and which give rise to various different orders among numbers, all equally legitimate.'[3]

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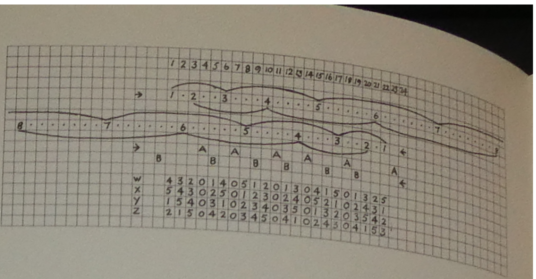
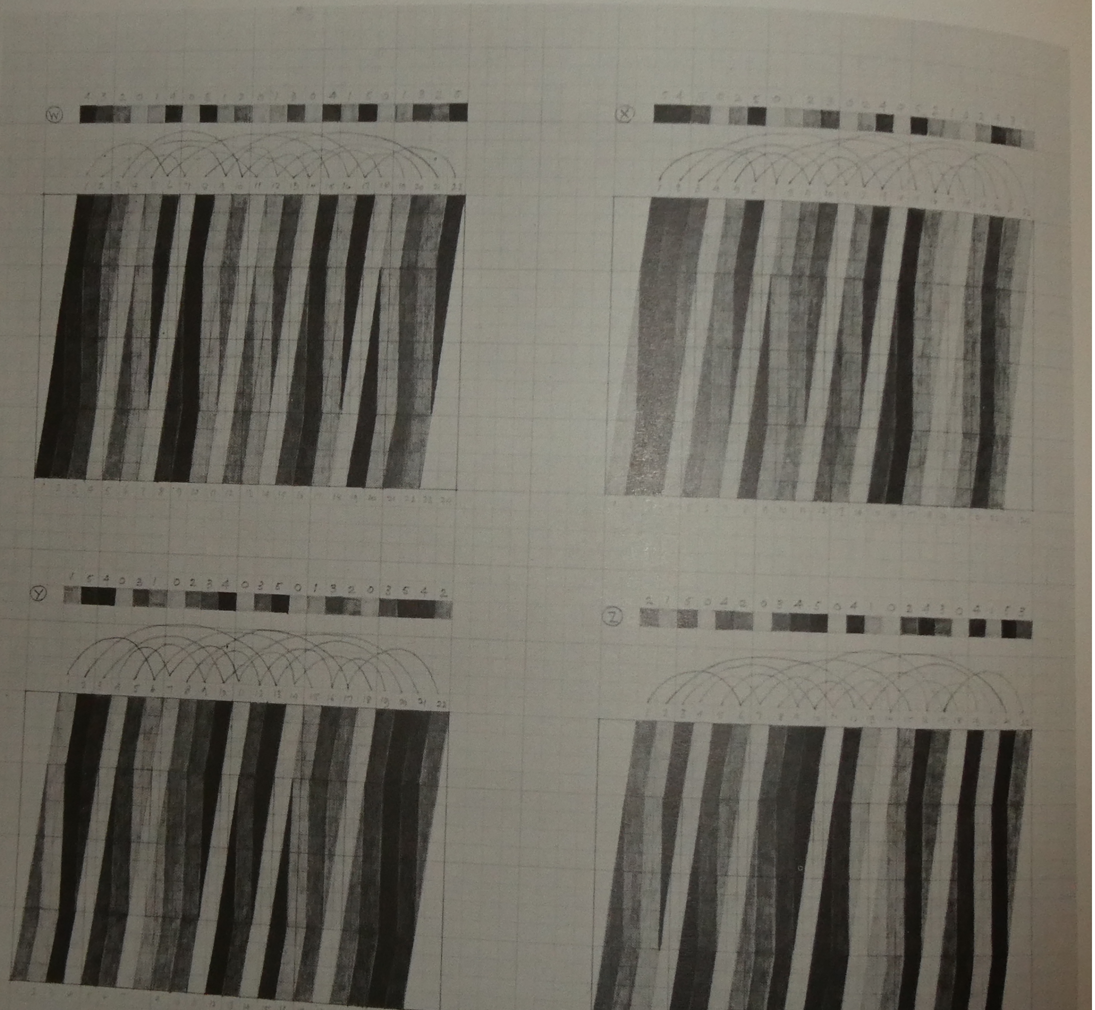
1. David Bohm, 'On the relationships of science and art', DATA, *ed. Anthony Hill, Faber & Faber 1968, p. 169*

2. D. Katz & R. L. Kahn, 'Common Characteristics of Open Systems', Systems Thinking, *ed. F. E. Emery, Penguin Books 1969, p. 103*

3. Bertrand Russell, 'The Definition of Order', Introduction to Mathematical Philosophy; *Allen & Unwin 1919, p. 30*

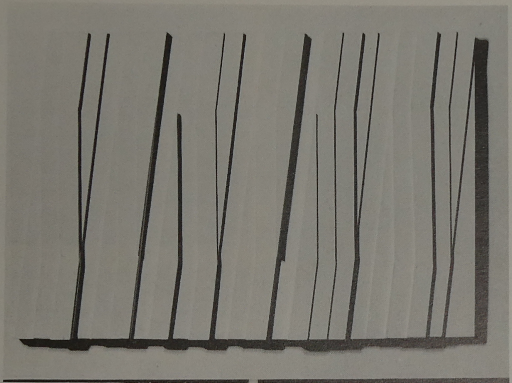

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
A
B
W 4 3 2 0 1 4 0 5 1 2 0 1 3 0 4 1 5 0 1 3 2 5
X 5 4 3 0 2 5 0 1 2 3 0 2 4 0 5 2 1 0 2 4 3 1
Y 1 5 4 0 3 1 0 2 3 4 0 3 5 0 1 3 2 0 3 5 4 2
Z 2 1 5 0 4 2 0 3 4 5 0 4 1 0 2 4 3 0 4 1 5 3

1. *Basic number structure*

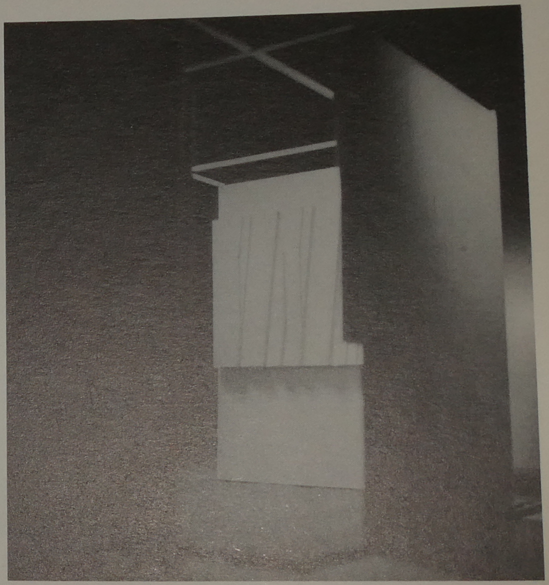


2. *Malcolm Hughes, four thematic drawings*

Graham Bishop,
Corry Bevington



3. *Malcolm Hughes, maquette for relief*



Right: **4.** *Malcolm Hughes,* Model of an environmental situation

My contribution to this exhibition has its origins in the ordering of elements that are derived from simple operations on number series. These operations—mainly concerned with methods of 'shredding' and extraction—provide the basic number structure upon which other operations (permutations etc.) can be carried out *(fig.* **1***)*. At this stage certain specific characteristics such as periodicity, rhythm and sequence emerge and provide thematic material that can be further examined by means of drawing *(fig.* **2***)*. These (whilst being complete within themselves as drawings), take part of the total information contained in the number structures and open up potentialities and create insistences that ultimately press for investigation at the physical level *(fig.* **3***)*.

Numbers in sequence can imply movement—not of a physical kinetic type, but of a conceptual kind—x precedes y and z follows y.

In the relief this dichotomy of the elements being seen simultaneously and yet being known to have a particular order and rhythm is further developed by the interplay of diagonal and vertical[4] (the perceptual cues for the dynamic and the static—for extension and containment).

The relation of the known to the seen is again heightened by the physical structuring of the relief—where uncertainties develop as to the reading of levels and juxtaposition, and where the use of light, both in a positive and in a negative sense provides a further measure of control. Real movement (by the spectator across the plane of the relief) extends the interest and vitality in this stable/unstable situation.

The need to extend this dialogue beyond the means offered by the single relief evolved in two directions:

1. At the conceptual level a concern for developing the thematic information through parallel modes led to the four reliefs appearing to be different yet, in fact, being based upon an identical number structure.
2. At the perceptual level the extension into an environmental situation (which this exhibition uniquely provides) enables the relation of the spectator, by way of his movement (relative to the four reliefs), to be infinitely variable *(fig.* **4***)*.

Both these concerns go hand in hand with a consideration of the part memory and time play in perception—especially when it is realized that it is not possible to view all four reliefs simultaneously, or from a single static viewpoint.

The working out of these essential dichotomies—this continual shifting of the conceptual and perceptual stance—the known with the uncertain, the finite with the infinite, the static with the dynamic, stability with instability—together with the need for the continuous renewal of the mode of examination of these paradoxes—is an aspect of what I am concerned with on the creative level.

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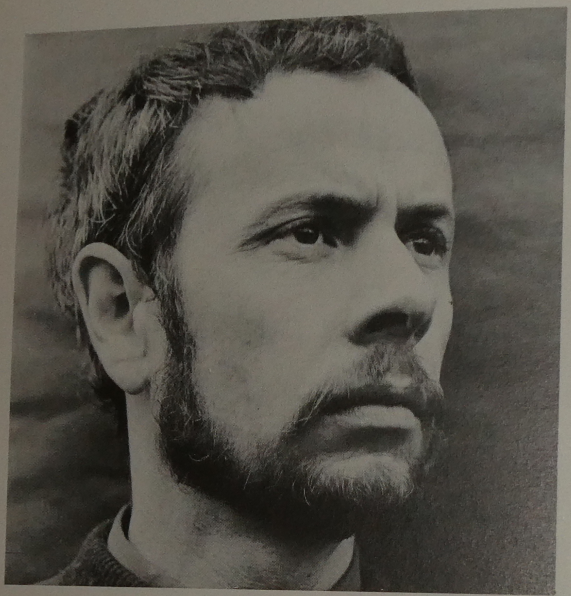
[4] *See Hans Reichenbach 'Unreal Sequences',* The Philosophy of Space & Time, *Dover Publications 1958, p. 147*

Colin Jones



Born 1934
Educated for three years at Rudolf Steiner School where he first came under the influence of the colour theories of Goethe and Kandinsky
Studied at Goldsmiths' College of Art under Kenneth and Mary Martin

Now teaching at Leicester Polytechnic

Some group exhibitions:
1963 + − inventions, AIA, London
1967 Unit, Series, Progression, Arts Council
Constructions, Arts Council (tour continues)
1968 Constructions, Greenwich Theatre Gallery, London
1970 Space Dimensions, Dutch Arts Council (tour)
Site, outdoor exhibition, Leicester
1971 Matrix, Arnolfini Gallery, Bristol

'Life is neither beautiful nor ugly, but without the sense of the beautiful, man would pass through life like an automaton.'

Georges Vantongerloo, *Paintings, Sculptures, Reflections.*

Since 1839, when Louis Daguerre perfected the first camera, three new visual media have been developed—Still Photography, Cinema and Television. They have taken precedence over most visual communication systems as methods of conveying information, news, drama, fantasy, fashion and style. They are enlarging our vision of nature in the sciences, and will fundamentally alter our methods of education.

With the perfection of the techniques of Holography, and further developments in colour and scale, it will be possible to have colour television in a fully three dimensional projection, and on a completely human scale.

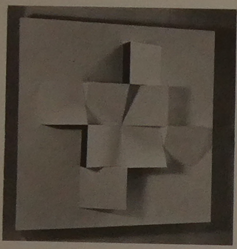
The traditional descriptive, illusionistic roles of Painting and Sculpture have now been largely superseded by the potency and scope of such media. Numerous attempts have been made to revitalise or synthesize Painting and Sculpture in the last fifty years, but nearly all have failed to produce any useful or positive developments for the future. The Art managers and critics continue to promote the fashionable manipulations of previous styles, as degenerate forms of art which express only sickness, confusion and the trivial.

The Art educators seem unable to accept the challenge of establishing creative education in the new media, and resort in their apathy to treating their students like 'art patients' in the 'institutes of self-expression'.

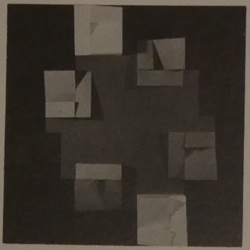
Photographic media, like representational Painting and Sculpture, continue to confirm the illusionistic recording of our vision of man and the natural world. Film and Television have already reached a point where they can become substitutes for physical activities, and real emotional experience. Events, discoveries, journeys can now be experienced passively at home in domestic comfort.

The difference between real and illusionistic experience may become crucial for our evolution as a species. We could lose the full potential of our sense perceptions. This is partly why we need the inventive plastic arts, which put aside the illusionistic in favour of working with the tangible, and demand a more intense physical participation from the spectator. The content of such work, which unfolds in the actuality of three dimensions is not based on literary concepts, but is 'silent', depending on our active physical and spiritual contemplation.

The constructive artist rejects the idea of his work as self-expression, seeing it more as a discipline like Engineering.



Colin Jones, Relief structure No. 2 *1969*



Right: *Colin Jones,* Rotation, *relief structure 1970*

Architecture, Philosophy or Mathematics. The programme of his studies is based on knowledge and facts, derived from empirical research, and attempts at the kind of objective reasoning more often associated with the scientific process, than with the 'mystical' vagueness of many contemporary artists.

Such a constructive artist may use the languages of precision—rhythm, number and geometry—not for their own sake, but through delight in their expressive power, as the Renaissance architects 'played' with geometric figures.

In the constructive domain, a practical interest in systems is inevitable. The constructed work is built up from components—elements of form, colour and space. The search for their inherent qualities and properties, grows out of the desire to express universal forces through relationships which are particular.

The work constructed from a visual system is envisaged as a 'sum of actions' rather than a concern with formalism in art. The constructed whole is often built up as an equivalent structure to formative relationships perceived in nature. In the relationship of parts to a whole, the process of formation is nearer to the composition of music or poetry, than many other visual art forms. A construct can be subjected to analysis, and the system broken down into sets, subsets, relationships, constituents, etc.

In the growth of a system, the inventive process is based on a limitation of means. A single element, through repetition or extension, can generate a sequence. An undulation, acceleration, pendulation, or oscillation can be expressed as actual or apparent motion. Such a sequence can be considered as a finite movement, as a unit which can be related to other such units, and a cumulative process begins.

We find in nature that symmetry operations can be seen at every level in the order of growth. These operations lie at the core of our concepts of structure. Rotations, Translations and Bilateral Symmetry are also found in the ordering of our perceptions of colour through a systems approach. In the divisions of the achromatic and the chromatic, the possibilities of modulation, progression, transition and contrast, generate sequences which can be built up into harmonic structures.

In the use of systems two differing processes seem to arise for the constructive artist. Firstly that of the predetermined programme, which may be permuted through set variations, and alternatively that in which the rules of the game are devised, and the process is one of play with conflict. The first method offers the possibility of surprise to the designer, where numbers become dimensions or colours and the system turns up clusters of an unpredictable character. The second approach is one which I favour, for in spite of the rules being devised at the outset, the play allows for a continual meditation on the possibilities of connections. This is a lengthy process, where the work is subjected to constant change, speculation, rejection, reformation and a pattern grows through a series of physical models.

When system becomes practical construction it begins to interact with the physical properties of its surroundings. The designer becomes spectator as the forces within the work act on his senses. It is at this stage in the formation of the structure, that I am forced continually back to the view that the social and spiritual function of such an activity, lies in its relation to the language of architecture.

From *The Naked Ape* by Desmond Morris:

'So, in all these spheres—in painting, sculpture, drawing, music, singing, dancing, gymnastics, games, sports, writing and speech—we can carry on to our heart's content, all through our long lives, complex and specialized forms of exploration and experiment. Through elaborate training, both as performers and observers, we can sensitize our responsiveness to the immense exploratory potential that these pursuits have to offer. If we set aside the secondary functions of these activities (the making of money, gaining of status, and so forth), then they all emerge, biologically, either as the extension into adult life of infantile play-patterns, or as the superimposition on to adult information-communication systems of 'play-rules'.

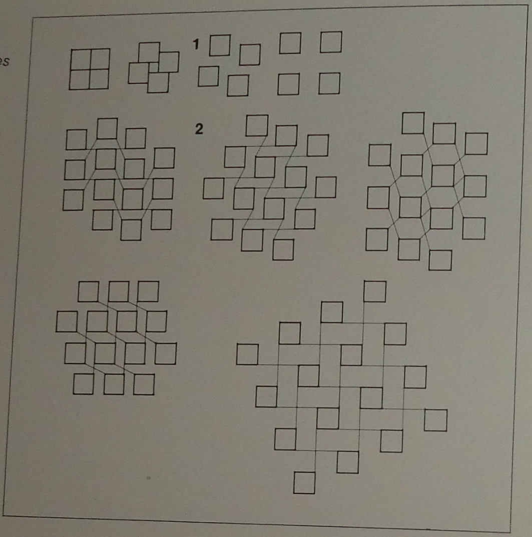
These rules can be stated as follows: (1) you shall investigate the unfamiliar until it has become familiar; (2) you shall impose rhythmic repetition on the familiar; (3) you shall vary this repetition in as many ways as possible; (4) you shall select the most satisfying of these variations and develop these at the expense of others; (5) you shall combine and recombine these variations one with another; and (6) you shall do all this for its own sake, as an end in itself.'

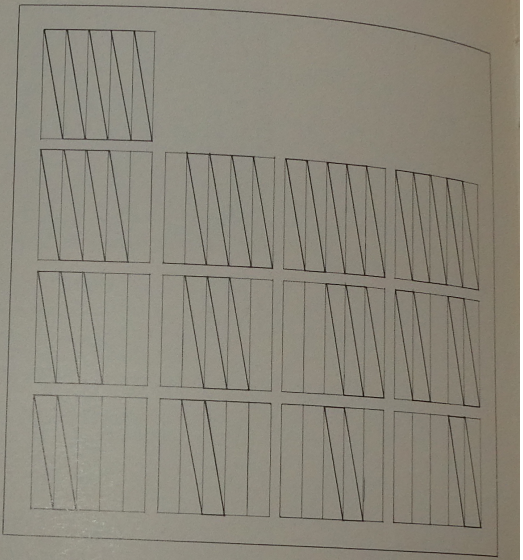
Symmetry operations: rotations

1. *A sequence of four squares rotated four times*

2. *Five clusters based on rotations, translations and glide symmetry. Four groups can be seen as rotations with a dislocated axis*

Right: Elements
Translation of four parallelograms within a square. Thirteen variations





Modular proportion system

1. *Perception of ratio along a line of five units length. Division in half:*

a. *Error causing perceptual irritation*

b. *Correct division in half*

c. *Clear division into dominant and subordinate lengths*

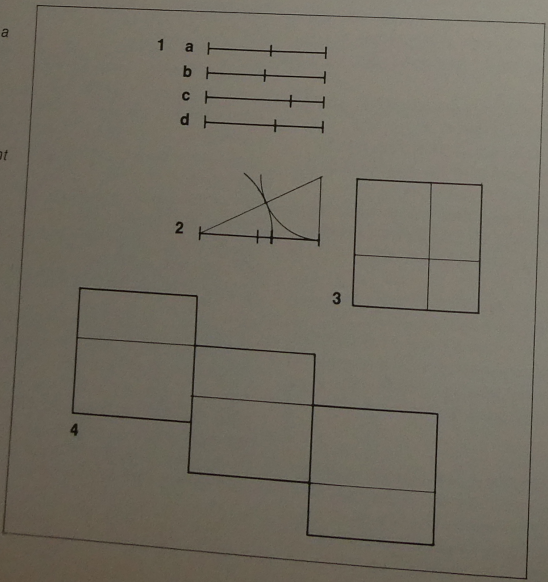
d. *'Balanced' or harmonic division of unequal lengths, ratio 3:2, in which 2:3 is as 3:5*

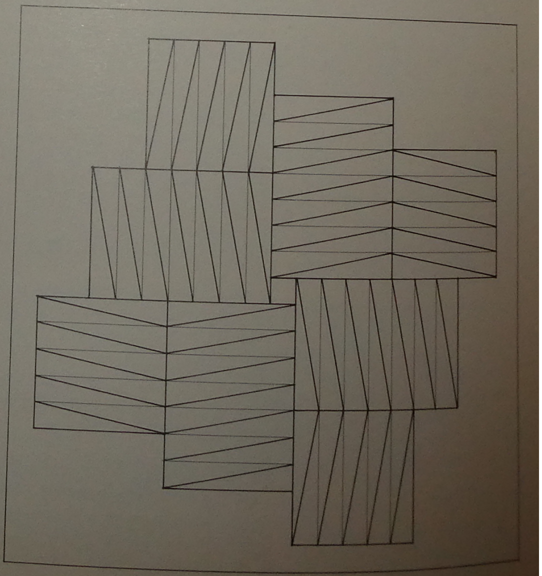
2. *Construction of a ratio 3:2 from a line of five units length*

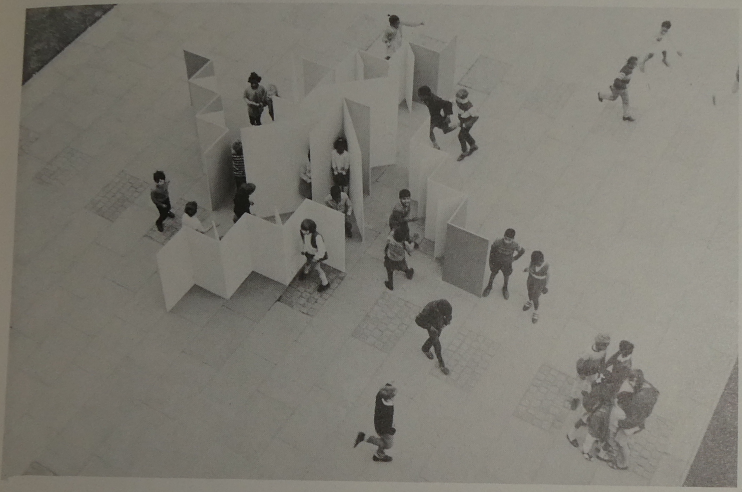
3. *Square divided into 'harmonic' ratios of area*

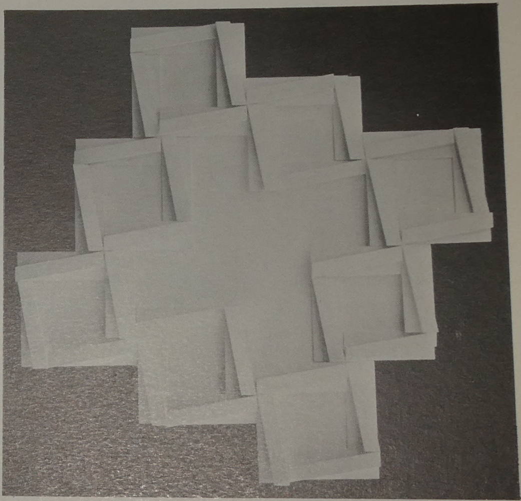
4. *A sequence of square units related through the ratio 2:3*

Right: Invention
Plan of format: construction built on ratios 1:2, 2:3, 3:5. Rotation of four rectangles and eight squares around a square unit. Translation of thirty-six identical elements







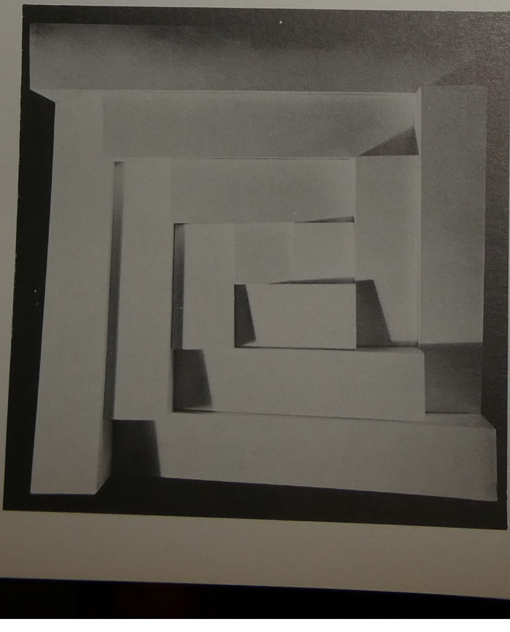


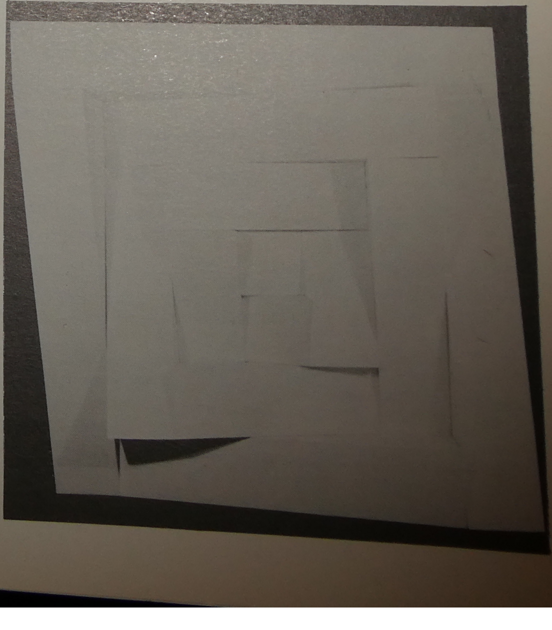
Above: *Colin Jones,* Rotation Translation Reflection Structure, *forecourt of 'Leicester Mercury' offices June 1970 Photo courtesy 'Leicester Mercury'*

Above right: *Colin Jones,* Rotations, Reflections, *relief structure 1971*

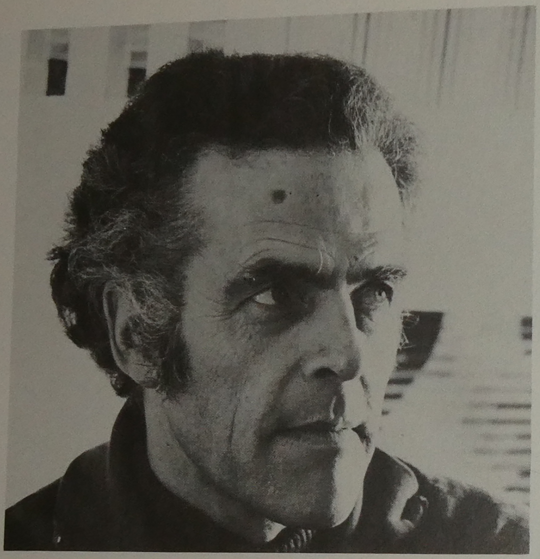
Right: *Colin Jones,* Spiral System V1, *relief structure 1970/71*

Colin Jones, Spiral System V2, *relief structure 1970/71*





Michael Kidner

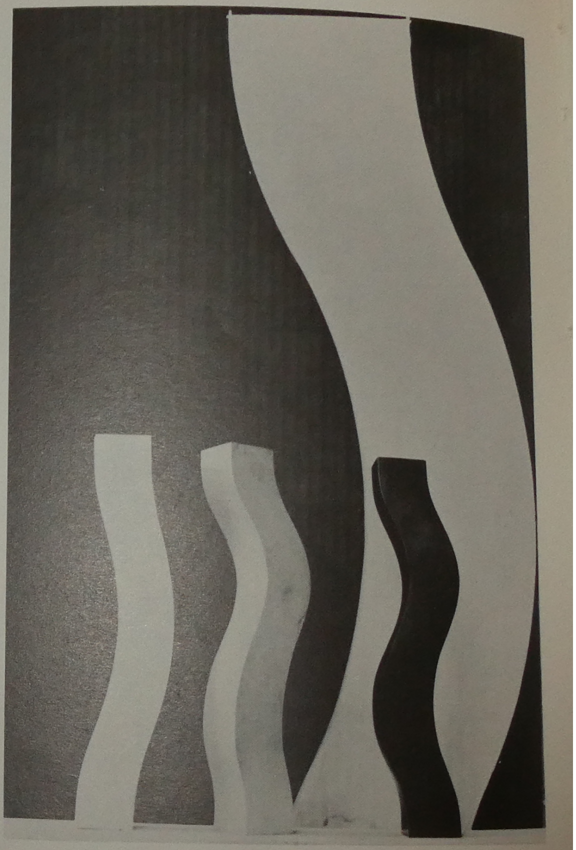


Born Kettering, Northamptonshire 1917
Artist in Residence, University of Sussex 1967
Artist in Residence, American University, Washington DC 1968

Now teaching at Bath Academy of Art, Corsham

One man exhibitions:
1959 St Hilda's College, Oxford
1962/64 Grabowski Gallery, London
1967 Axiom Gallery, London
University of Sussex, Brighton
Arnolfini Gallery, Bristol

Some recent group exhibitions:
1967 4 British Painters, Betty Parsons Gallery, New York
Recent British Painting, Tate Gallery, London
1969 Arts Council of Northern Ireland (prizewinner)
System, Amos Anderson Museum, Helsinki
1971 Matrix, Arnolfini Gallery, Bristol

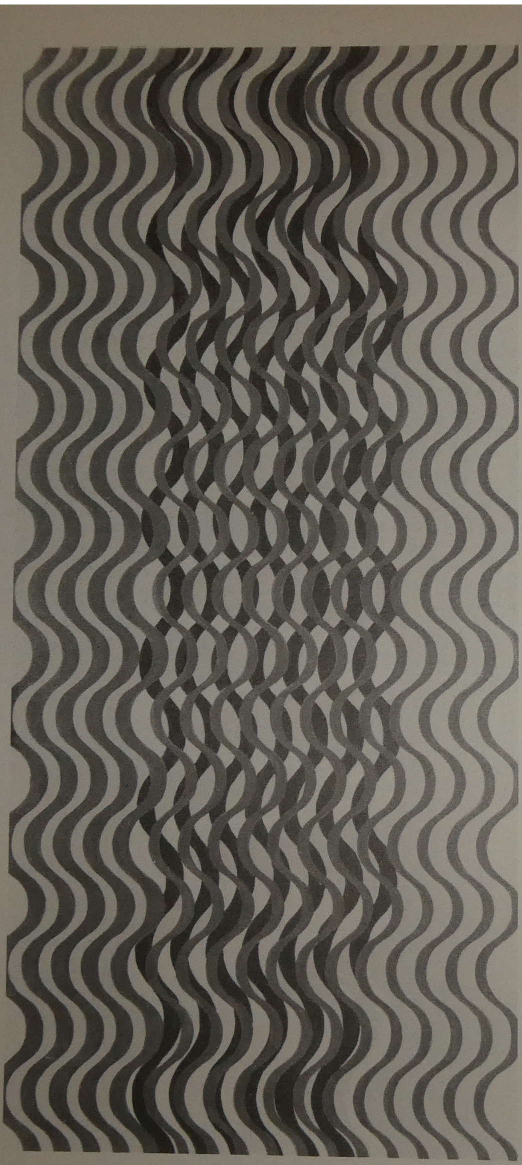


1

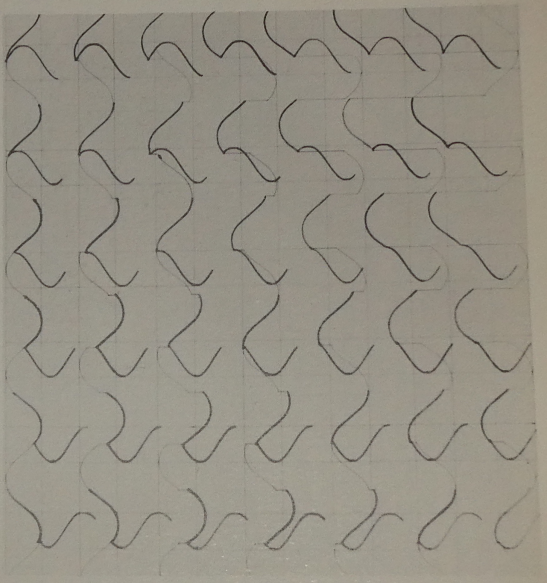
The concept of heaven is perfect because you can never enter it in this life. It is a two-dimensional order and therefore a painter's paradise. But when you start to occupy your imaginary order you meet with some surprises. It is the area between the second and third dimension which interests me—the order that lies between imagination and reality. Reality involves experience.

If an object can be seen as a finite number of points in space then as I move in relation to the object so the points move in relation to each other. The pattern they reveal is contingent upon the points I select and my movement. This pattern might be described as the syntax of the object.

Michael Kidner, Waves *1964*,
48" × 22", oil on canvas.
Right: Colonnade *1971*



Hugh Gordon

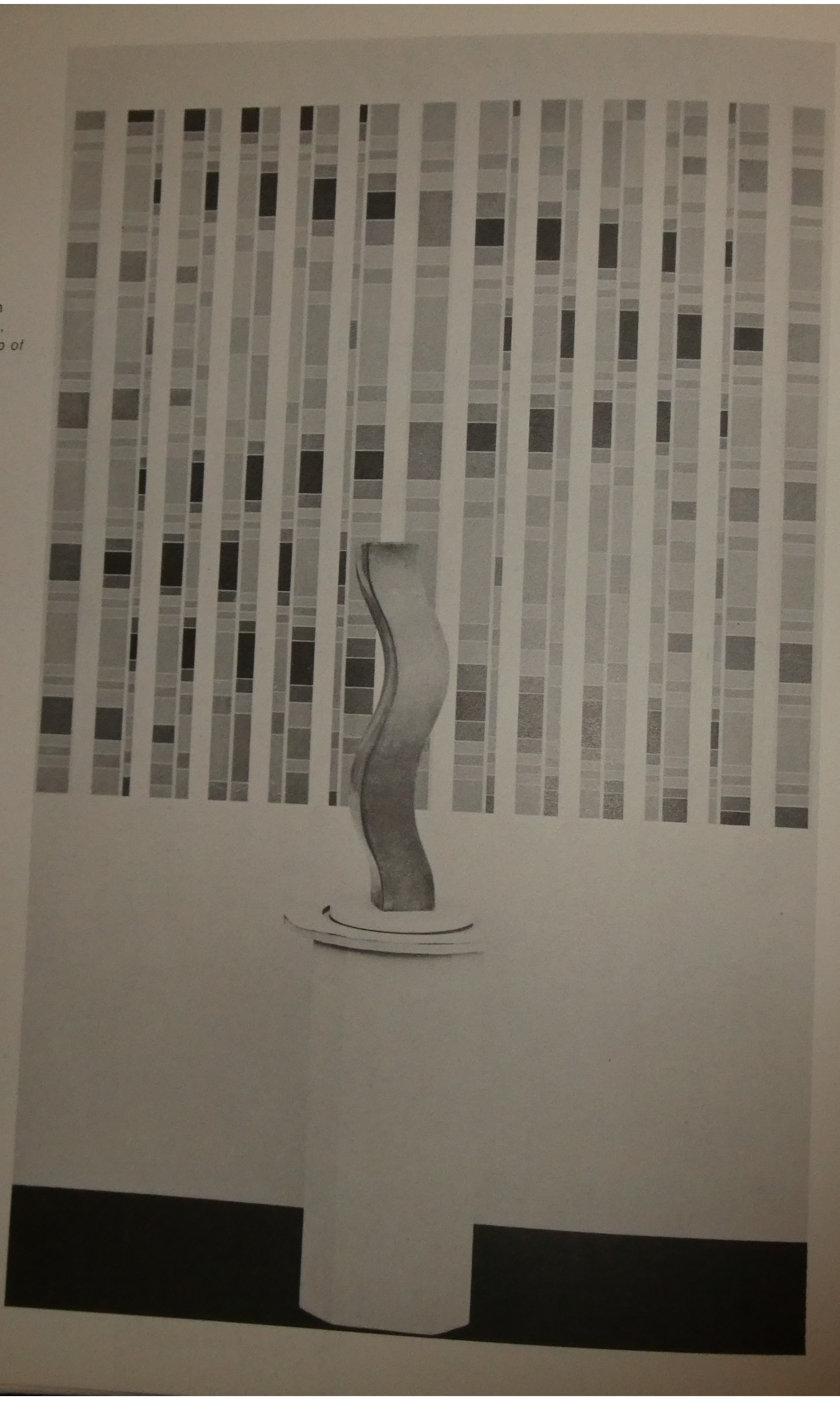


The starting point for the work in the present exhibition was a column constructed in 1969. My interest in the column lay in the fact that it brought two wave surfaces into relationship with each other. The points where the two surfaces met formed a 3D line.

2
I had been interested for some time in the wave form as the illustration on the left indicates. But I now discovered what seemed to me to be a novel aspect of a well-worn truth, that the drawings I made of the column when I walked around it produced a different symmetry from the drawings I made when I spun it; more explicitely that I became a contributing factor in any 3D order while remaining an observer of a 2D order. 2D order is a product of the imagination.

It seemed necessary to present both the three-dimensional and the two-dimensional experience of the column simultaneously. Because the relationship between the two experiences was not immediately perceivable, I decided to augment the work with a series of photographs. Again, because of the single source of light, it made a difference whether I moved the camera or rotated the object between shots.

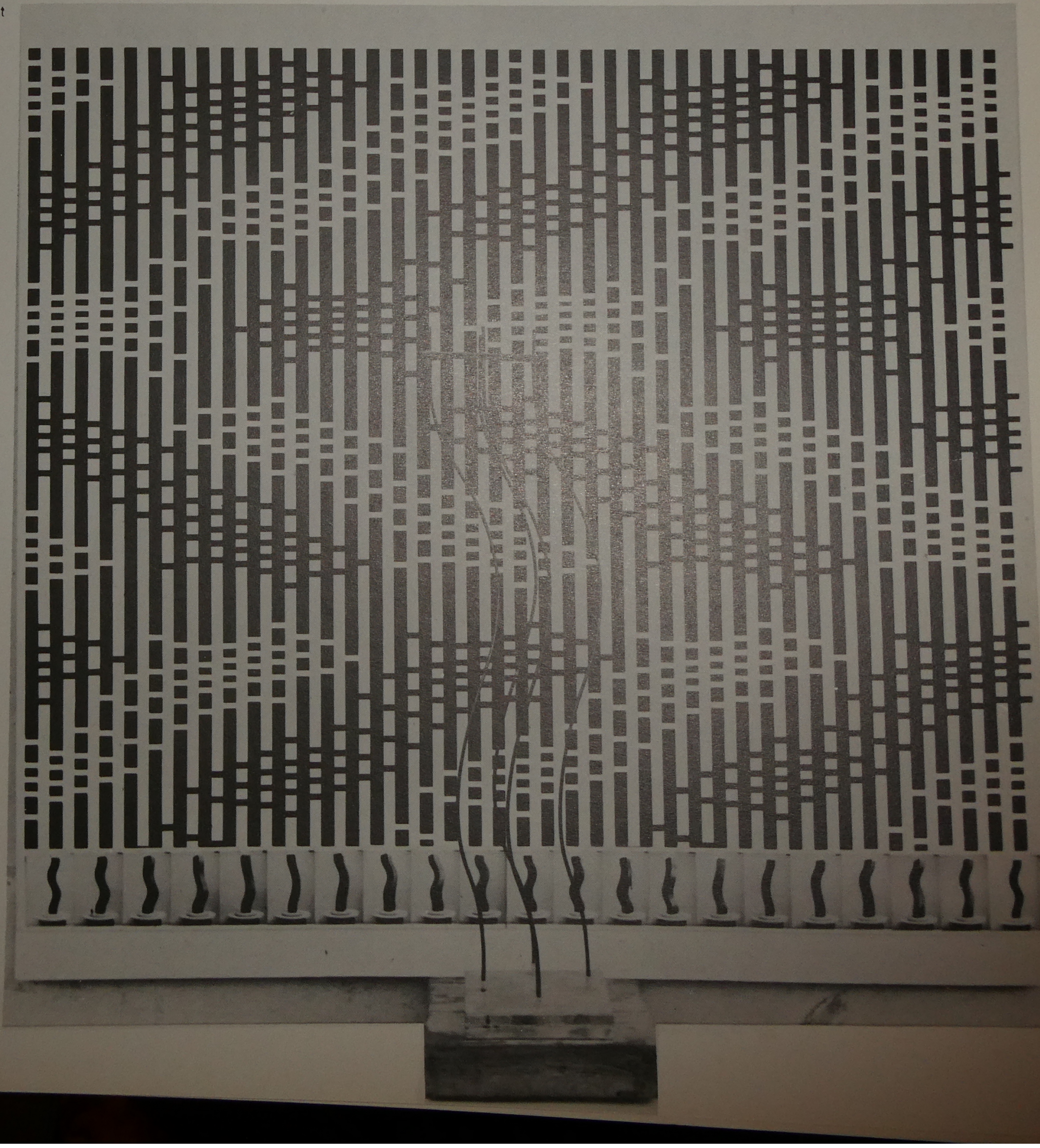
3
In my work I am concerned that the relationship between the artist and the object should at all times be equal rather than that the object should merely reflect the artist. When art becomes solely a matter of an individual artist's vibrations then he is surrounded by a clique instead of a public. A painter may think of himself as *creating* order, as *discovering* order, or as *observing* order. These are three attitudes implying a different relationship between the artist and his notion of order.



Michael Kidner, Column in front of its own image *1971, height 55" from floor to top of column*

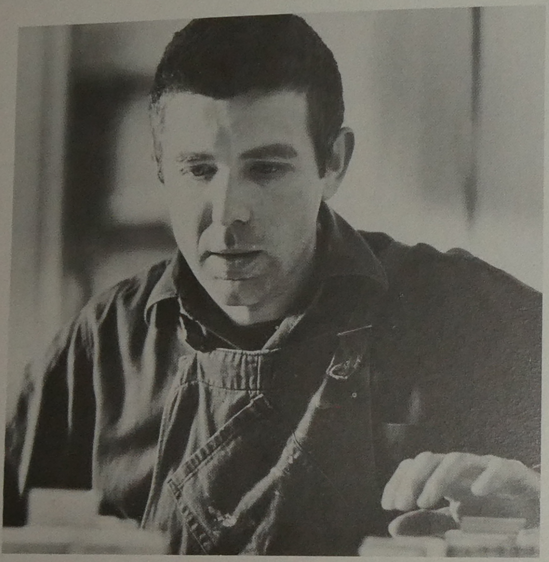
Jean Campbell

Michael Kidner, Column in front of its own image, *second version 1971, 46″ × 43″ × 8″*



Jean Campbell

Peter Lowe



Born in London 1938
Studied at Goldsmiths' College of Art under Kenneth and Mary Martin

Now teaching at Goldsmiths' College of Art

Some group exhibitions:

1963	*The Geometric Environment, AIA, London*
	+ − inventions, AIA, London
1967	*Unit, Series, Progression, Arts Council*
1968	*Cinetism, Spectacle, Environment (collaboration with Philip Hodgetts and Kenneth Martin), Maison de la Culture, Grenoble*
	Constructions, Greenwich Theatre Gallery, London
1969	*System, Amos Anderson Museum, Helsinki*
1970	*Space Dimensions, Groningen Schiedam*
1971	*Matrix, Arnolfini Gallery, Bristol*

Systems are present in all art. Art has always referred to systems outside itself. Ideas in art can be conveyed to a limited extent by mathematics. Conversely, mathematical ideas can be presented by means of diagrams and three-dimensional models. The current reorientation of art towards mathematics coincides with interdisciplinary activities in the arts and sciences. Extensive use of diagrams in recent literature on topology, particularly graph theory and combinatorial geometry, has been a stimulus to several artists.

Non-mimetic (abstract) art and the objective nature of its processes tended to realign artistic thought with that of other disciplines. John Ernest, Anthony Hill, Kenneth Martin and Mary Martin pioneered mathematical content in non-mimetic constructed art in Britain from the 1950s onwards. Their work and writings demonstrate considerable differences in their individual application and emphases on mathematics.

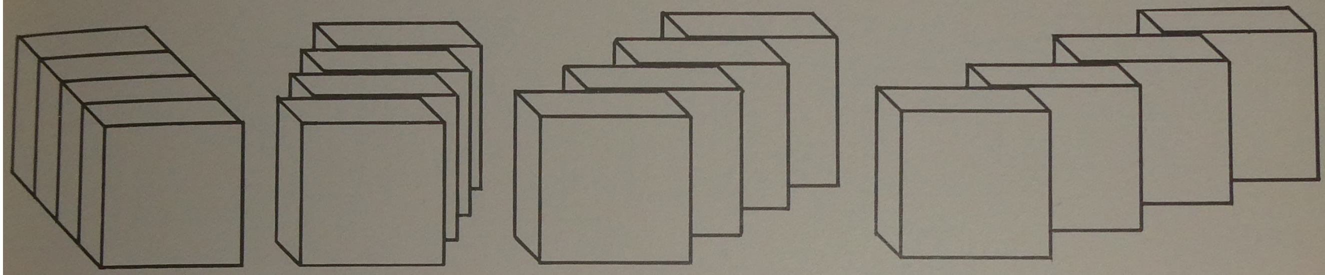
The extent to which order is perceptible in constructions for which order is claimed as a basis can serve to distinguish one work from another. I sometimes ask myself whether it is the responsibility of the artist to make his ideas explicit through his work or whether it is the responsibility of the public to inform itself. The answer seems to be that the artist owes it to himself to be aware of what he is trying to do. If his ideas are not clear in his works maybe something is wrong with both. My general classification of 'order-based' constructions into those in which order is apparent and those in which it is a matter of conjecture, suggests the observation that as factors increase in number so do the possibilities of order and disorder. The existence of few factors allows few possibilities of order and less risk of disorder.

The geometry in mimetic painting is usually conjectural as far as its precise nature goes because it is, or has been, a part of the artist's skill to integrate it with his subject matter. Cubism disrupted the conventional syntagm associated with objects in painting by the introduction of multiple views and displacements. The cubist painter Juan Gris subordinated it still further to geometry. He is reported to have stated:[1]

'I consider that the architectural element in painting is mathematics, the abstract side; I want to humanise it. Cézanne turns a bottle into a cylinder, but I begin with a cylinder and create an individual of a special type: I make a bottle a particular bottle—out of a cylinder.'

Georges Vantongerloo was concerned with abstract art and mathematics as early as 1917. The following excerpt is taken from his book, *Art et son Avenir*[2]:

'I picture myself for a moment in front of the public who are asking me to tell them what is sculpture and what do I understand



by plasticity in the art of sculpture.
Numbers (for example the number 100) are going to furnish an example.
I assume that I am in the presence of people who do not know how to calculate.
Sculpture is x number of small juxtaposed sculptures which together form the unity of the work (head, fragment, group etc . . .) The number 100 is a number composed of a quantity of numbers running one into another: 1, 2, 3, 4, etc.

My listeners not knowing how to calculate will say to me: ''I do not understand very well. Could this be a science that is beyond my understanding? Will you please go back to the question of the number 100?''
But I shall say: ''That's enough for today.'' '

Max Bill first met Vantongerloo in 1933.[3] In an article called 'Mathematical Thought in the Art of our Time', Max Bill recalls a statement by Kandinsky who, in 1912, postulated the premises of an art in which the imagination of the artist will be replaced by the concept of mathematics.[4]

In 1930 Van Doesburg made a painting which he called 'Arithmetical Composition'. It is clearly based on drawings for an abstract film.[5] These drawings are given the descriptive title 'From Surface to Space. Six moments of a space-time construction (with 24 variations), formation of a diagonal dimension'. These drawings exemplify serial construction in abstract art, perhaps for the first time.

Combination is paramount in works which are constituted by the recurrence of identities. The individual act of invention is not in the forms themselves but in the particular ordering of them. Observation and classification precedes the mastery of form because it magnifies freedom of choice. Once certain forms have been selected and various possibilities and impossibilities realised, it becomes apparent sooner or later that subsequent arrangements are prescribed by known or unknown laws inherent in the forms and processes.

The selection of procedures and forms can initiate events and appearances which are not prefigured in the imagination. The unknown is present in the known and familiar. Its revelation in one's own work and other people's is an incentive to make further discoveries. Intuition is not ruled out by use of systems. Analysis of a few items of information offers the basis for predicting the most interesting line of study without having to attempt the impossible task of examining every option. In addition to the natural constraints imposed by the material means there are the artificial constraints imposed by the artist. These govern and are governed by the natural constraints of the means. It is the emphasis on the artificial order which characterises constructed art.

Serial thought is implied in my works separately and collectively. In serialisation, thoughts and acts take place one after the other in a single line. One of the characteristics of serialisation is its potential for infinite development. This poses the problem of where to stop.

The integers 1 2 3 4 can be represented by a cube cut into four equal strata. Progressive stratification of the cube can be signified by the serialisation of four discrete groups of one, two, three and four strata. Any arrangement which does not destroy the sequence is permitted. Thus 1 2 3 4 and 4 3 2 1 are the only possibilities. These sequences can be arranged as rows or as arrays within a grid or an 'L tetronimo'[6] (see figures).

In the arrays within the grid they become helical forms which are clockwise or anti-clockwise. The L tetronimo gives four groups. In fact there are two other types, the 'T' and the 'skew' tetronimo, giving another ten arrangements. The first two straight tetronimo configurations are seen strictly as rows. The helical arrangements may be seen as horizontal rows or vertical columns of spiral paths or obliques. Within the orthogonal there can also be the implied curve and oblique.

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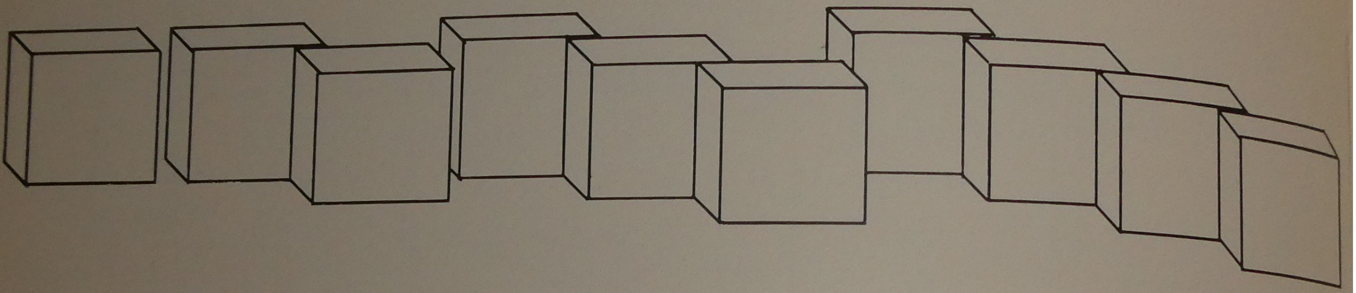
1. *A. Kahnweiler,* Juan Gris: His Life and Work, *1947 p. 138*
2. *G. Vantongerloo,* Art et son Avenir, *1924 p. 13*
3. *Centre National d'Art Contemporain, Paris,* Max Bill. Oeuvres 1928-69 *p. 14*
4. *ibid. p. 39*
5. *T. van Doesburg, 'Film as Pure Form' 1926. Reprinted in* Form *No. 1 Summer 1966, p. 5*
6. *S. W. Golomb,* Polyominoes, *1966 p. 19*



These arrangements can be permuted without destroying the original sequence or else it can be destroyed by permuting the four strata within each tetronimo. Permutation and serialisation can be applied to drawing, volume, colour or notation. Applied to notation it becomes remote from the particular attributes of these three things. A line for example can be divided into intervals to correspond to a number of units in the row of a permutation. Other lines might be joined to it at intervals determined by the corresponding elements in the permutation. A cube already has affinities with notations based on the number six. In other words, a form can be selected to fit a notation or a notation can be designed to fit the form. A single notation can be orchestrated in different ways. Recovery of a notation can, theoretically, be accomplished by analysis of the work itself.

The structure illustrated in orthogonal projections *a, b, c* and *d* stems from earlier themes on the stratification of the cube. In the final version, each stratum measures 8 x 8 x 2 inches. The four groups are fixed in line along a 16 foot wall. Serialisation, permutation and module all play a part in the structure. The notation derives from a particular permutation of the integers one to four.

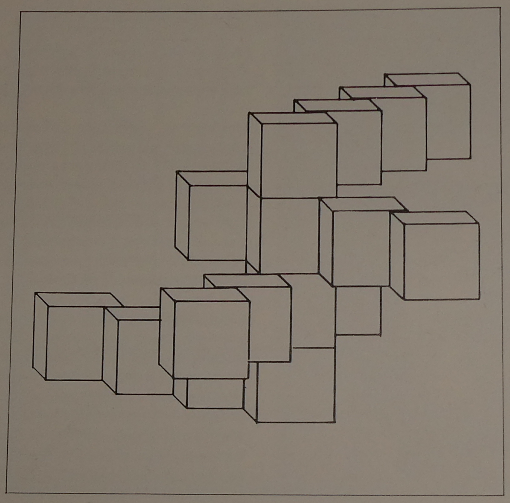
```
1 2 3 4
3 1 4 2
2 4 1 3
4 3 2 1
```

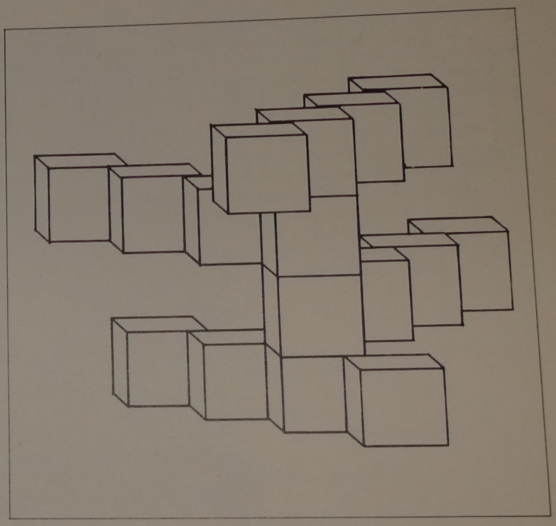
In the first stages of this series of works the strata are shifted sideways forming steps (see figures). Using a module of the thickness of one stratum, four types of step are arrived at. One of these is rejected as unsuitable because it is not joined. I choose from the remaining three. In order to be as consistent as possible I also apply the sideways shift to each row in the notation making each number in turn into a vertical column. In the final structure this is a vertical trunk or stem for the horizontal branches which are stepped towards the spectator or towards the wall behind.

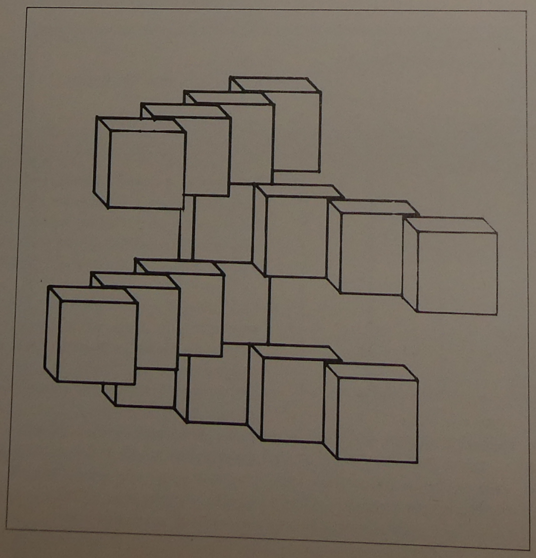
There are a total of four groups to which four groups of strata are made to correspond.

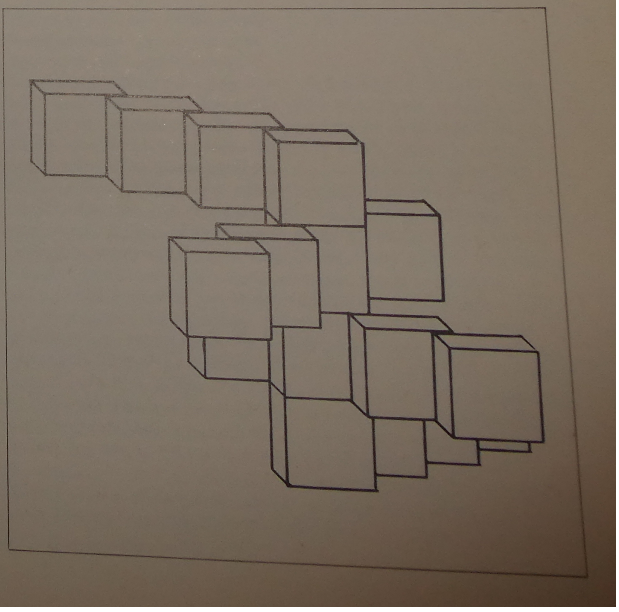
```
      1 2 3 4
    3 1 4 2
  2 4 1 3
4 3 2 1

    1 2 3 4
3 1 4 2
      2 4 1 3
  4 3 2 1

    1 2 3 4
        3 1 4 2
  2 4 1 3
      4 3 2 1

1 2 3 4
  3 1 4 2
    2 4 1 3
      4 3 2 1
```

The order in this work can be seen in spite of perceptual complexities arising out of scale, materials, and three dimensions.



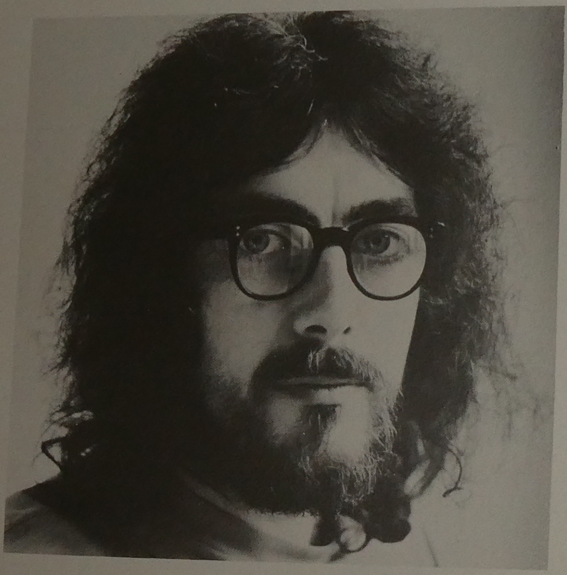






James Moyes

A vibration tent



Born 1937
After a grammar school education on Tyneside attended Dartmouth Royal Naval College and then studied Electrical Engineering at St Andrew's University
Worked as BBC recording engineer 1959
Studied at Chelsea School of Art 1962-66

Now teaching at Bath Academy of Art, Corsham

Some recent group exhibitions:
1967 *Axiom Gallery, London*
1970 *Critic's Choice, Tooths Gallery, London*
1971 *Matrix, Arnolfini Gallery, Bristol*

The vibrations

Non-figurative, parallel, articulations of sound and light have been numerous. The condition of relationship between sound and light which interests me is the non-arbitrary.

The body of scientific knowledge amassed by way of controlled phenomena creating limited and measurable experience subsequently structured as concepts, has established usable notions concerning sound and light which allow an insight into possible non-arbitrary, inevitable relationships between the two. Both sound and light can be thought of as vibrations, each phenomenon has a measurable, discrete velocity in the same conditions, and each as a result of the foregoing has associated wave lengths and frequencies.

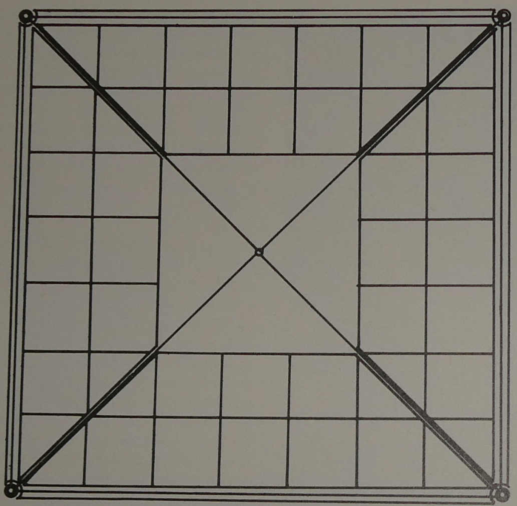
If the physiology of the eye and ear is considered, the differences between sound and light are also apparent. Although the means of transferring a stimulus from eye and ear to the brain are similar, the stimulus itself is arrived at differently—the ear is essentially a physical discriminator, requiring and responding to mass-pressure-force-energy, whereas the retina of the eye discriminates electro-chemically. Recent work (source unknown) has shown that there is a certain interdependence between the sensitivity/acuity of the eye and ear at a point in time.

From these considerations the following equivalences seem sensible:

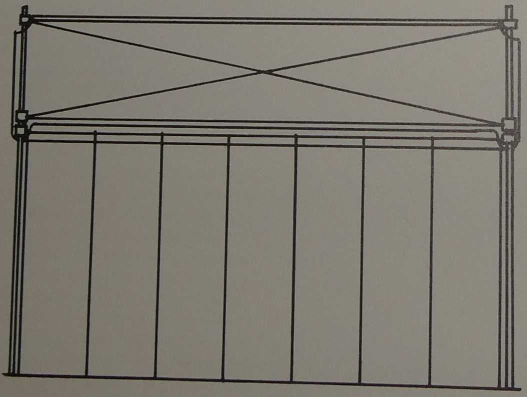
Light	*Sound*
Tone (lightness/darkness)	Loudness
Hue	Pitch
Intensity (saturation)	Timbre

The frequency range of the eye is just less than one octave, while the ear has a range of about ten octaves; this means that any stated equivalence between a particular colour and a particular pitch would, in the terms so far indicated, be possibly arbitrary—for instance it would not be possible to maintain simultaneously octave relationships and full range relationships between the two.

The sun is the most considerable source of white light, to an extent the concept 'white light' is light from the sun: the evolution of the eye could be thought of as being a conditioned response to the existence of sunlight in great abundance on the surface of our planet and to the tremendous usefulness for survival which sensitivity to light gives. 'Colour' is a small range of frequencies within the limits of the visible electro-magnetic frequencies (the smaller the range, the purer the colour). White light can then be thought of as the sum of all pure colours, and this can be shown to be so experimentally. White light can be approximated to by the use of incandescent lamps.



The Tent: schematic elevation,



The Tent: schematic plan,

In sound, the equivalent phenomenon to white light is the equal sum of all audible frequencies. This is known as white noise. White noise occurs naturally only at very low levels in common experience, and usually only in special circumstances—both physical and psychic. Alone at night in a quiet place one's preoccupations are erased by the perception of a short, unexpected sound; the ears strain to order this sound, and the background noise of the ear seems to swell. This 'sound of silence' is an approximation to white noise; for me it is associated with the inner abyss of no concept, the shock of raw awareness and just 'being'. White noise can be approximated to by amplifying the output of an unmodulated electronic valve. (Each atom of a hot body radiates independently of the other, and at different frequency. When the power of this (noise) is, per unit frequency interval, independent of frequency, it is known as white noise). From the foregoing there emerges a satisfactory and usable equivalent relationship between sound and light, i.e. a simultaneous manifestation of white light and white noise, so arranged that darkness is paralleled by silence and brightness by loudness. This is the theoretical framework for the work.

The tent

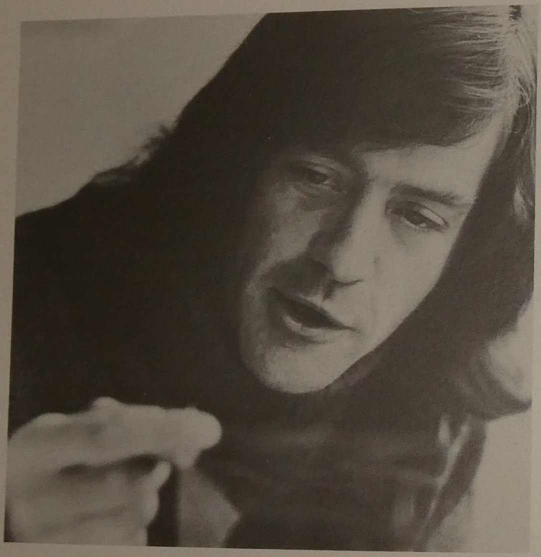
The physical structure of the tent has been designed in terms of practical necessity; the main considerations are:
the allotted space
the ease of erection, dismantling and moving
the making of an adequately sound proof inner cell, with satisfactory illumination
the convenience and safety of entrance and exit.

A consideration of some arrangements

The white light is from electric lamps, the white noise from a loudspeaker.

The most interesting way of varying the sound/light would seem to be one which relates most fully to the individuals occupying the cell. For this reason a fixed programme of variations is not particularly attractive; a more satisfying arrangement is one in which sound/light are modified by the presence of people and under these conditions it is natural to think of people as the stimulus and the variations in sound/light as the response. In the same way the most interesting response is a variable one; this is achieved by incorporating a variable sensitivity device. The sound made by people is the most convenient stimulus to select; a microphone therefore provides a variable signal ('programme') which activates the response. The amplitude of this response is a function of the state of the variable sensitivity device. For any particular instant the variation in sensitivity is a function of the amplitude and duration of the immediately preceding 'programme' of stimulus; thus a normal stimulus will activate a considerable response following a period of silence, but the response to such a stimulus would be negligible following a period of loud conversation. One possible state of equilibrium of the mechanism is that after a stable, quiet period for a few occupants there could be a parallel, sympathetic and noticeable response to the stimulus of the breathing sound.

David Saunders



Born 1936

Studied at St Martin's School of Art and the Royal Academy Schools, London

Artist in Residence, University of Sussex 1970

Associated with the Portsmouth Sinfonia and the Ross and Cromarty Orchestra

Now teaching painting at Liverpool and Portsmouth Polytechnics

One man exhibitions:
1965 AIA, London
1969 Greenwich Theatre Gallery, London
1970 University of Sussex, Brighton

Some recent group exhibitions:
1967 Survey '67, Camden Arts Centre, London
1968 Wales Now, Welsh Arts Council
1969 System, Amos Anderson Museum, Helsinki
1971 Matrix, Arnolfini Gallery, Bristol

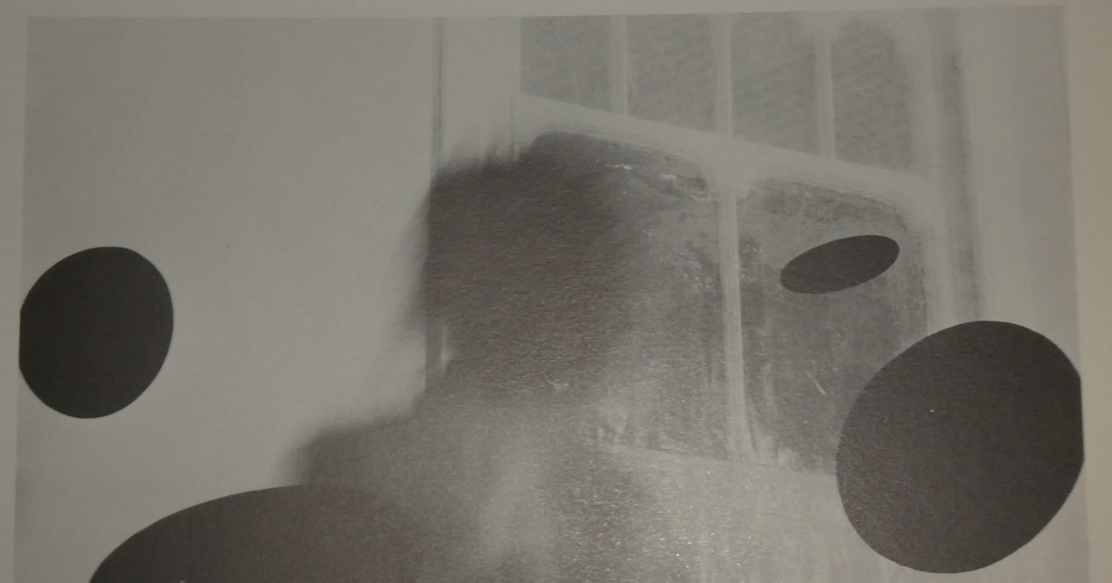
The correlation of intuition and method is essential to a creative process which seeks to reflect and inform the changing structure of our *Weltanschauung*. This mode of working is clearly distinct from art as isolated, angst-ridden, blind actions competing for attention on the shelves of the international cultural supermarket. 'System' denotes sharing of information, the unity of ethics, aesthetics and logic and the rejection of individualistic expressionism. There is no such thing as the 'system style' since the patterns of thought are constantly changing and individual plastic works are purely samples of an ongoing generative process.

The development of effective generative processes may be helped by the use of conceptual notations which have affinities with certain forms of musical score which display an open form allowing for the entry of varying and partly unpredictable contents. In fact the word 'score' seems more appropriate here than 'program' which is heavy with technological connotations and is altogether too suggestive of mechanistic behaviourism. For present purposes then, a score can be taken to mean a conceptual notation showing a logical form which is capable, within certain limitations, of receiving content. A logical form is simply an empty or generalised form—a syntactic arrangement of terms and relations without natural designation. Finding possible contents for a generalised form is interpretation. But works are not made out of logic. If it is possible to construct a physical arrangement from a generalised form, then the form is logical. If it is not possible, then the form is meaningless. We cannot say which come first, logical forms or particular instances of forms. A work which clearly displays its logical form also shows, implicitly, what other forms it might take—whatever can be said in one way can be said in any number of other ways and still remain the same.

An ideographic notation may bring to the level of consciousness those things that we know but are not consciously aware of, and at the same time indicate a possible interaction of events in the external world. An observation by G. Spencer-Brown concerning the relationship between the mathematical and the physical sciences seems relevant here: '*It becomes apparent that if certain facts about our common experience of perception, or what we call the inside world, can be revealed by an extended study of what we call, by contrast, the outside world, then an equally extended study of this inside world will reveal in turn, those facts first met with in the world outside: for what we approach, in either case, from one side or the other, is the common boundary between them.*'[1]

In perceiving structure in generalised form we distinguish between signs which denote items and those which denote relations. Items are not necessarily 'things' but may be qualities, values, actions or any other conceptually distinguishable features. In

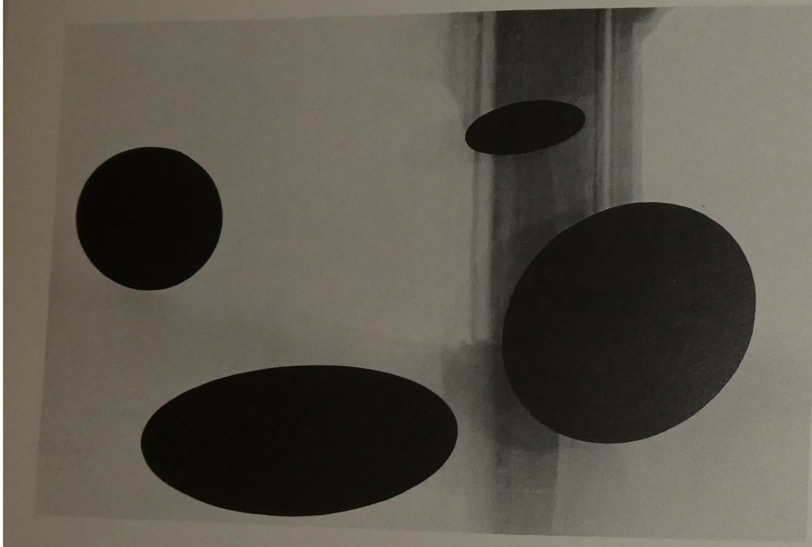
1. *Laws of Form, London 1969 p. xvii*

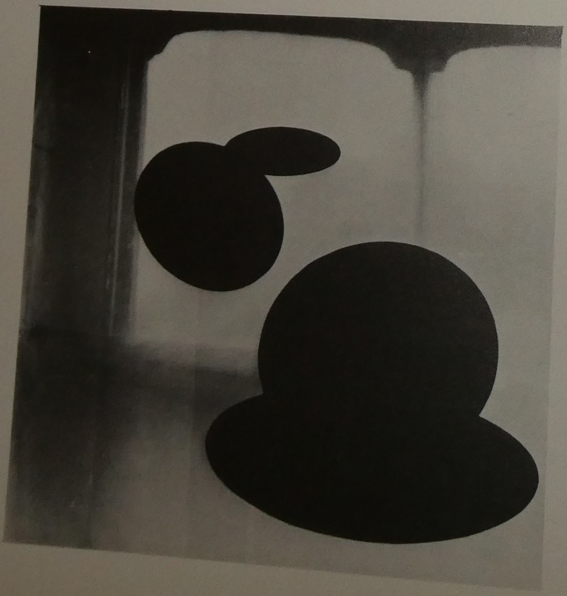


David Saunders, Studies 1970/71, polyester and PVC

addition, we may consider instruction signs which indicate a transformation from one state to another and quantifying signs which denote the degree of generality. Concerning the invention and use of ideographic signs, the following ideas are important:—

1. Radical distinction between kinds of signs in terms of their functions. 2. Avoidance of false suggestion. 3. Avoidance of the use of signs for one purpose which have been traditionally pre-empted for another. 4. Occam's razor. The formal context thus





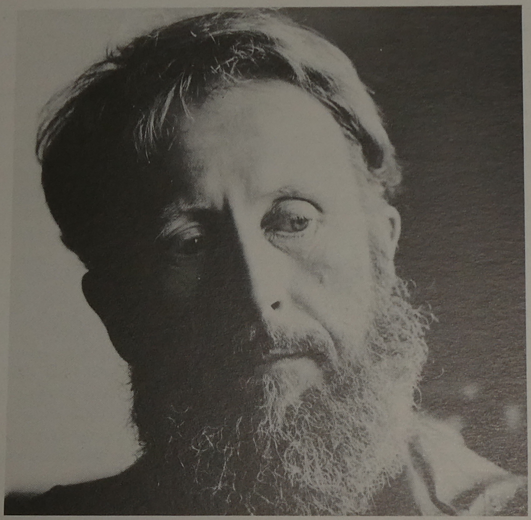
David Saunders, Studies 1970/71, *polyester and PVC*

established, with its constituent and logical relations is a concept which may be embodied in many different works which are individual *conceptions*. The conception elicits the maximum information (process) from the minimum number of elements and constituent relations (system). It follows that, while I am not concerned to make a kind of mathematical art, the idea of 'elegance' as understood by mathematicians is of great importance.

The process of making (or performing) a work is that of revealing to oneself and others the set of possibilities contained in the conceptual notation. Though consistency of method is important, the process is not mechanical any more than is the interpretation of a musical score. Since the performer is human the possibility of error is always present and it may be precisely this which leads us to previously unknown experience. (Here, 'error' should be taken to mean inaccuracy which may have a cumulative effect, rather than inconsistency which would jam the process.) In any case, what is elicited is some emergent characteristic—some new information. An emergent characteristic is that property which a complex exhibits which could not be predicted solely through an examination of its constituent parts. Prediction is not possible because we do not have complete knowledge of the parts. This must include knowledge of their combinative properties and it can only be gained by actually combining the physical entities. We know that common salt is composed of sodium and chlorine but there is no way of knowing through an examination of the properties of these elements in isolation that a completely different set of properties, having nothing in common with either, would result from their combination. In painting, the combination of *colours* by means of proximity, extension, chroma and value gives emergent characteristics at both the perceptual and emotive levels.

The universal equilibrium in art which the neo-plasticists sought cannot be completely expressed through singular plastic entities (what Mondrian called the 'abstract-real') but through a dynamic relationship of amount of order to amount of variety which ranges across our entire field of experience. Thus we no longer see art as isolated discrete objects (although there will always be discrete objects, paintings and things as well as events) but as a field of overlapping and connected cyclic processes, as forms oscillating between the determinate and the indeterminate, and between the abstract and the real. A rough and ready schema would be: external world (the whole complex of sense experience)—internal world (ideas condensed)—raising of internal knowledge to the level of consciousness (score/system)—realisation in spatial/temporal form (experience in the real world). The plastic work is in itself a score because, by displaying its inherent system, it indicates what other possible forms it might take.

Geoffrey Smedley



Born 1927
Studied at Camberwell School of Art and Slade School of Fine Art
Started making abstract reliefs 1958

Now teaching at Portsmouth Polytechnic

One man exhibitions:
1965 AIA, London
1969 AIA, London
St Pauls School Gallery, London

Some recent group exhibitions:
1966 Structure '66, Welsh Arts Council
Experiment in Form, Grosvenor Gallery, London
1967 Sculpture in the Round Tower
Constructions, Arts Council (tour continues)
1971 Prints, Hiscock Gallery
Matrix, Arnolfini Gallery, Bristol
Art Spectrum South
Forma Viva, Pirano, Yugoslavia

There are certain keys left (and perhaps others), which open doors and windows on the world, some of them are shapes, some colours or words. The keys have to fit two sorts of locks, those inside, and those outside our heads. If I were asked for my key-word, I would say 'Relationship'. And if I were asked for the key relation I would say *Reflection*. It is the central relation, mirroring life into death; it is clear only when we are still; it breaks all images when jogged; and when ideas breathe upon the surface of the mind it becomes misty and diffuse.

It's not that a thing isn't itself, but it's always many things beside. If there are things, there are spaces between them. A worldscape of doors isn't a barren labyrinth, the doorways may be trees, mountains, moss or water; and they are trees, mountains moss and water too.

I don't mind making contradictory statements so long as they are true. It is easy to feel the relation of reflection and inversion in awareness. Whitehead said somewhere, ' . . . we are in the world, and the world is in us', and St. John, ' . . . He was in the world, and the world was made by Him . . . '.

Underlying, overlaying. My idea of layering isn't one that's simply-connected. I don't think much of Peer Gynt peeling his onion. There must be some fruit whose exotic geometry offers a more convincing model of experience than that . . . and when the peeling is done doesn't leave an empty centre.

Sewing machines use two threads to fix layers of fabric together. If one thread is mind, the other is matter: idea—object, process—stuff, feeling—fact, it's still not dualism, but why argue it anyway; except the unfelt object is still-born, and ideas alone are ghosts. Feeling is a form of thinking, it can tackle problems reason cannot formulate. Precise feeling can penetrate clearly into vague regions, although to say what we see there may involve making a new language, or at least new grammar. But having spoken there will still remain a landscape of doors. In one way or another the 'Systematic' is an attempt to chart these unfolding landscapes.

I think of the systematic aspect of my work in two ways, and don't give precedence to one more than the other. There's the mapping activity I've just mentioned, and then there is the straightforward use of simple mathematical tools to compose a work. But in the end it's not quite as straightforward as that, because I look upon geometrical and other processes as being symbolic ones. I hestitate to use terms like 'symbolic processes', but the fact remains that a list of geometrical transformations could be matched by metaphysical or psychological ones:
Identity
Inversion
Translation

Rotation
Reflection, and all symmetry operations
All elastic transformations.
And then, because everything is itself, and stands for something else, there is the world of things. The symbolic objects. I suppose I have some rough hierarchy here, many of the 'things' are archaic artifacts, and many more come from the natural world. Mazes and Rivers—symbolic objects; Networks and Pathways, symbolic processes.

The form 'Systems' take in my work will I hope be clear from the various pieces I am showing. So far as the project (which I call 'Proposition'), goes, the system is very simple, it is in the shape of a screen, with folding screens imposed on it. While the overall thing rifts horizontally, the images of the screens are inclined on its surfaces. Its history is simultaneously rigorous and dispersed. I was much taken by a Japanese screen in the Guimet three or four years ago, that was the start of it. I reduced the 'screen form' to the conjunction of the square and a parallelogram, and the evidence of a small part of the compositional devices I explored in a lateral relation to the project itself are shown on one screen. On another panel are some photographs and photostat diagrams of a 'Piazzaform' sculpture I made for 'Forma Viva' at Piran in Yugoslavia during the summer, which I hope will illuminate my thoughts by contrast. In the 'Piazzaform', all the systematic relationships are gathered into the work, and the numerical sequences are limited by certain means, while the internal disposition of 'Proposition' is simple; it stands in relation to complexes outside itself which are capable of infinite extension.

For the rest of these notes I am offering examples rather than arguments.

Comments on 'Comments without Text'

I think the 'Elusive' and the 'Systematic', are two sides of the same coin, and the chances are looking for one will reveal the other. The piece of the 'Comments' printed below is a fragment of a fragment. On the one hand its conception is open-ended, and so is not neatly rounded anyway, and on the other, for reasons of space only a limited portion can be included in the catalogue.

Art always has an invisible side to it, and I had this in mind when I started the footnotes to an unwritten text, a text which we would know all about if it were possible to provide limitless annotations (connected in a rather complicated way). It may just be possible to see the 'shape' of it from the piece which is here; I fancy it turns back on itself, and occupies a finite space (in the enigmatic sense that geometers imply when they describe the magic process of packing infinities of points between given ones).

I don't know what the overall form should be called, and it's not important, except that thinking of it as poetry may cause more confusion than clarification. It is often diffuse, but then so is my experience; it is equally elliptical, and I can only hope that the descending footnotes, or the illusion of them, will account for this. The unrelenting use of the lower-case in some sections is probably very irritating, but it seemed essential to write it in this way, not primarily from the point of view of stress, but largely to respect the meaning of the words. darwin is not the same as Darwin. I feel quite clear about this, although I would be foxed to explain the difference, it has something to do with time, or the living and the dead, or being elsewhere.

Again the lack of punctuation (except for the indices which are best ignored at first for serial reading), may look a pretty hackneyed affectation, but in these parts I would have only reduced what the words said by cutting their chain into pieces. Commas and full-stops would destroy the feeling that the words, phrases, and sentences had drifted in from some other context and were only tenuously anchored ready to depart. I have no further excuses to make, other than to say that I used 'we' where 'I' would have been stronger, not through shyness, but because I felt what I was writing was something others shared, even if you do not.

The first section of four hundred footnotes is grouped in sixteen batches of twenty-five lines each. I have thought of the spaces between the lines, and in later sections there are insertions on the left hand side, which at their best add up to a further sequence of annotations; other than that they act as conjunctions.

001-400, was written first, and has the element of a dissertation, a kind of ontological-epistemological pudding, of what (I think) is, and how (I know) it is.

The 'Comments' are autobiographical, but I don't mean to pretend for a moment that I have any knowledge of the History of China, all I have done is to gaze time upon time at the Ritual Bronzes, nor have I seen Jai Singh's observatories, but I have read what little there is available in English on them. So far as Darwin goes, I think his allegories are there whether he intended them or not, and the same is true of Haeckel's German drawings. In the whole of this section a connection between the first and last lines makes some kind of sense (001-400, 001-100, 001-025 etc.), if you can spare the time to glance at them, and can forgive the grammar of a wayward telegrapher.

After 400.000, the notes were not written in sequence, and an appendix may well have been written, or made, before the text to which it refers.

I have noticed that the form of the first part is like the serpent which eats its own tail, and can only hope that the later sections will begin to measure how much of himself he has consumed, and what his topology is.

Appendix on indices

The object of the indices is to build up a dense network between lines, a network which mirrors the connectivity and coincidence of everyday life. I think such a system may also reflect a fragment of the n-dimensional fabric which clothes our imagination.

The indices are locations within a field without ordinates or abscissae; the field they describe is mapped by their association one with another. One numbered code sets up line sequences where each number stands at an intersection, for example, .001 is the crossing of .001
.002
.003
etc.
with .001.001.001 etc, or put more graphically,
.001.001.001 . . . etc
.002
.003
etc.

If the first code weaves, the second branches; it is the radial one. These references are catalogued by using the prefix R, before the line of the branch. So the first line of a radial set could be, .001 R. .002 .003 .004 etc., and if this branch were to divide again, then R would be employed once more to show where it had happened, and we could follow a path like this, .001 R. .002 .003 .004. R. .002 .003 etc.

Where a number occurs without any adjacent text it simply shows that the end of the line has come.

Numbers prefixed by A indicate an appendix, and the annotation of these follow the same system used for line notes.

So far the structure is a two dimensional one, but quite alternative bonds can be established beyond those suggested by the indices, so even   meaning can feed back to print out   evidence of experience we scarcely knew we had.

Comments without Text

001 things are
002 because
003 we say
004 they are
005 a vocabulary of need
006 pronounces reassurance
007 that we are
008 connected by
009 words and food
010 all ways and always
011 to the manifold
012 which is
013 our inadequate way
014 of saying
015 everything
016 and
017 everything else
018 working or playing
019 through
020 all
021 known and unknown
022 relations
023 recognise
024 essence as action
025 with no alternative

026 accept contradiction
027 and grope
028 for
029 other sounds
030 other signs
031 so as to say
032 things
033 we cannot think
034 take care
035 rashly like time
036 when with
037 greater generosity
038 could
039 give instead of take
040 care
041 or simply
042 realise
043 watching a world
044 empty of ourselves
045 is not objective
046 but
047 trivial
048 observation
049 which stops up
050 cracks

051 and do
052 not
053 know-how
054 thin-lipped
055 to glimpse
056 yet
057 talk
058 about
059 backs of minds
060 and other
061 simply located places
062 while
063 it is
064 clear
065 bits of experience
066 adhere
067 to
068 the
069 skewer of words
070 we stick through
071 the gap
072 which while not there
073 separates
074 each from the other
075 and trash

076 mere
077 canopies
078 ascending in cathedrals
079 indicate
080 symbols of symbols
081 and their shadows
082 cast solid
083 in
084 an un-examined medium
085 which
086 we could see
087 if
088 our eyes
089 had words
090 other than those
091 which prejudice
092 chance
093 or
094 nudge opportunity
095 into
096 entirely alternative
097 ways of saying
098 an
099 intensely
100 empty universe

101 possession
102 is
103 an idea
104 of solid states
105 fluids
106 sea
107 mist
108 rain
109 offshore
110 limits
111 air-space
112 watershed
113 involve
114 idiotic observations
115 sand in suspension
116 is
117 an
118 inexorable process
119 transferring
120 ownership
121 in
122 absence
123 of breakwaters
125 and

176 hope it will remain the same
177 law
178 connecting
179 laws
180 elsewhere
181 and generalise
182 in
183 one
184 ridiculous
185 mutter
186 praise
187 our theoretical
188 prowess
189 in connecting
190 that
191 which was never apart
192 while
193 holding in abeyance
194 all notions of identity
195 and can't help
196 trying
197 to formulate
198 experiments
199 to determine
200 whose dream we are in

276 jesuits
277 used
278 samrat
279 yantras
280 remote
281 knowing
282 through a light haze
283 greenwich
284 and
285 zurich
286 not knowing
287 where it was
288 forced
289 the
290 royal navy
291 to carry chains
292 of chronometric
measurements
293 about
294 circumstances
293 which
294 gave darwin
295 material
296 for
297 an eagerly awaited
300 allegory

301 life
302 is
303 a
304 word
305 unspelled
306 unblemished
307 by
308 cause
309 unearthed
310 minds
311 awake
312 asleep
313 fall
314 in
315 a
316 falling
317 abyss
318 grasp
319 they
320 are
321 still
322 alive
323 to
324 realise
325 truth

326 is in the
327 quality
328 of a statement
329 and is not
330 qualified
331 by rigour
332 but forked
333 wound round
334 ropework
335 know by
336 nomads
337 celts and arabs
338 twined truth
339 turk-headed knots
340 interlock
341 innocent helices
342 whose alchemy
343 identifies
344 that which is
345 not
346 possible
347 in given spaces
348 inside or out
349 of
350 heads

351 working assumptions
352 already described
353 did not require
354 a methodology
355 other than myths
356 and saw
357 no separate sciences
358 like psychology
359 entertained
360 no views
361 on scholarship
362 to impede
363 direct association
364 and had no word for fact
365 which referring to things
past
366 is
367 dead matter
368 exuded by life
369 in the form of
370 a gigantic toenail
371 making the logarithmic
spiral
370 we are committed to

384 prompts haphazard
385 ideas
386 to ramble on
387 and realise
388 economy
389 is a relation
390 in nature
391 sparse
392 equal and opposite
393 life
394 and no-life
395 resolve
396 to spend cells
397 and fishes eggs
398 as limitless currency
399 in the effort to see blind
400 what has changed

001.001 For example,
002 undivided
003 white is one colour
004 unprinted
005 a folded map
006 outlines
007 an undistinguished place how
008 as if clasped in fog,
005.001 and we,
002 with an ageing congregation of ideas
003 huddle
004 (to entertain the uneasy knowledge that they believe in heaven)

005 and are aided
006 now and then
007 by gentle baroque devices
008 to face grief's cold punctuation.
008.001 Bereft.
002 As if in some clear light
003 we find
004 we have lost
005 that which shared
006 our habit of connection.
009.001 Bitter.
002 We cannot love in past time.
003 We cannot match words to instances.
004 Although we write history
005 there is only now.
006 Stranded in the present
007 we see the image of identity
008 and its after image
009 A tree without leaves
010 without substance
011 branching as decisions branch
012 we are guided through the maze of past potential.
013 A living tree makes each new branch
014 shorter than the last
015 its twigs
024.001 fade against the sky
025.001 in ultimate digression.

026.001 memory ideas scatter
002 reflecting then as birds
003 in now rapidly disperse
004 is one category or flock
005 from the list as one
006 of knowing a diffuse object

027.001 roots jostle rocks
002 in earth
003 to bury flowers in the sky
028.001 in place of
029.001 other sights see
030.001 things
002 as symbols
003 sacred whose
004 (soft stone seen through)
031.001 without words in
032.001 things
033.001 feel
034.001 and cautiously
035.001 wait
036.001 in an adjacent time

037.001 to love
038.001 and can
039.001 close at hand
040.001 afflict or heed
041.001 innocence
042.001 made real
043.001 to observe
044.001 subjectively
045-050
001 all forms of censorship

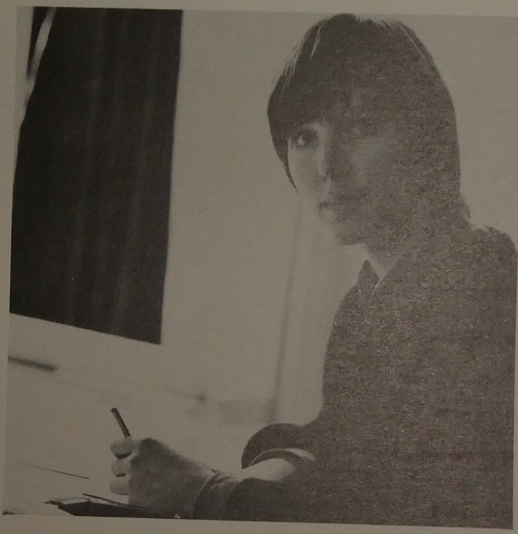
076.001 unmixed : Pure
077.001 the form of churches
078.001 in churches
079.001 reflects
080.001 immanence
.002 infinitely regressive
081.001 and echoes
082.001 the dimensions of the world we are in
083.001 in us
084.001 and shared substances
085.000

086.001 behind the white square
.002 with the edges of a sound
003 and the geometry of pain

087.001 endurance

088.001 named places
089.001 outruns the naming
090.001 numbers numbering
091.001 (exhilarated by boredom)
092.001 adopt small cubes
002 thrown from a box
003 in gaming
004 dies
093.001 as an alternative
002 create impressions
094.001 men make
002 their names
095.001 code
096.001 codes
097.000
098.001 in an
099.001 involvement total
with
100.001 themselves

Jean Spencer



Born 1942
Studied at Bath Academy of Art, Corsham

Now teaching in the Art Department, Berkshire College of Education

One man exhibitions:
1965 Bear Lane Gallery, Oxford
1969 University of Sussex, Brighton

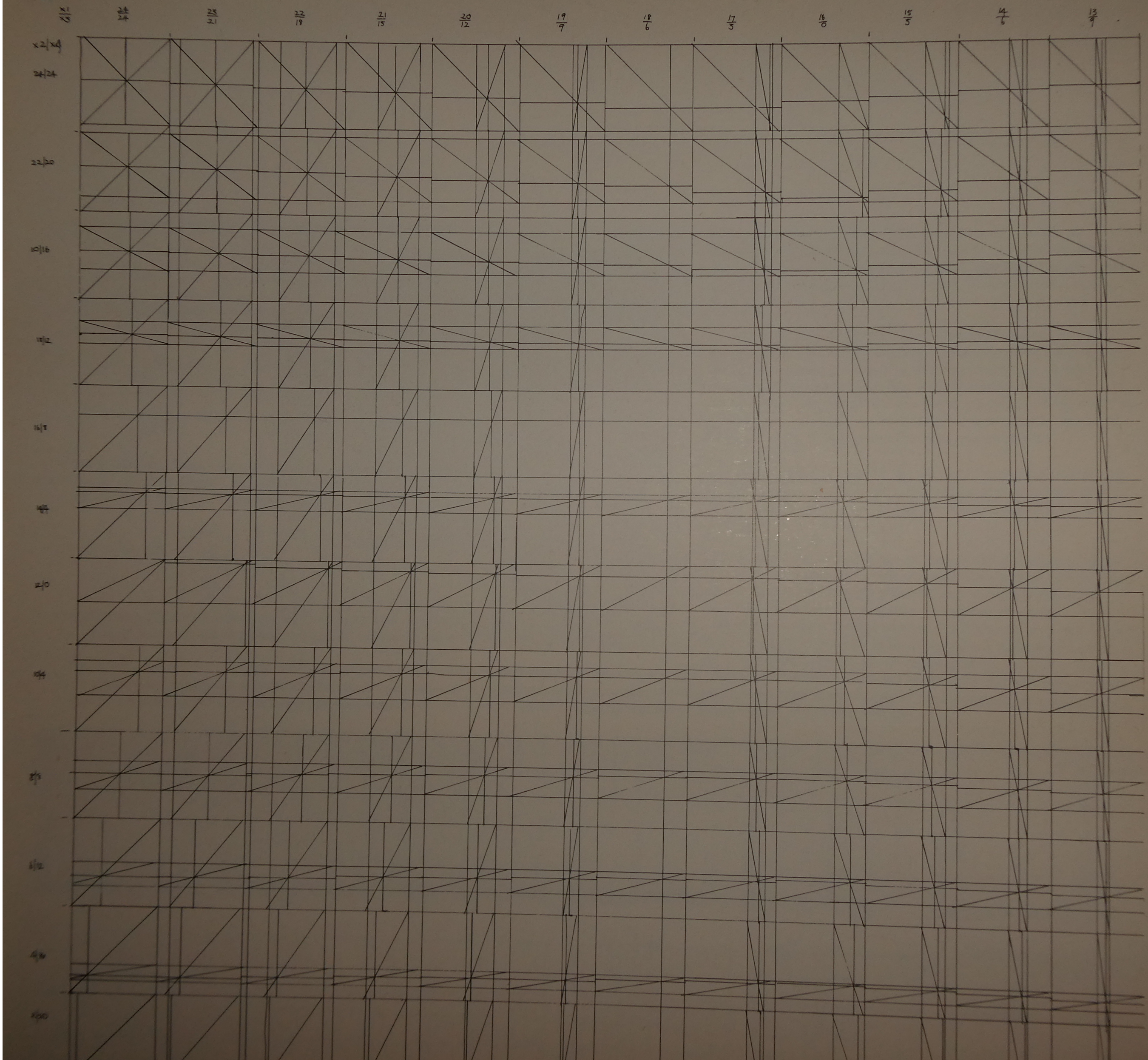
Some recent group exhibitions
1967 Axiom Gallery, London
Unit, Series, Progression, Arts Council
Constructions, Arts Council (tour continues)
1969 System, Amos Anderson Museum, Helsinki
1971 Matrix, Arnolfini Gallery, Bristol

> *'He was a man capable of disinterested action, of unostentatious generosity, that does not necessarily mean a man of feeling, nor a pleasant man, nor a scrupulous, nor a truthful, nor even a good man. A partial goodness, in which there persisted, perhaps, a trace of the family whom my great-aunt had known, existed probably in him in view of this action before I discovered it, as America or the North Pole existed before Columbus or Peary. Nevertheless, at the moment of my discovery M. Verdurin's nature offered me a new and unimagined aspect; and so I am brought up against the difficulty of presenting a permanent image as well of a character as of societies and passions. For it changes no less than they, and if we seek to portray what is relatively unchanging in it, we see it present, in succession, different aspects (implying that it cannot remain still, but keeps moving) to the disconcerted artist.'*
>
> Proust, *Remembrance of Things Past*

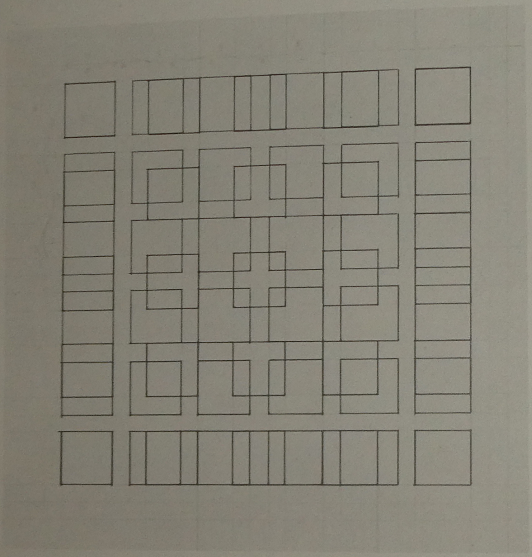
The expression 'System' is intended to convey the total structuring forces present in the work—conceptual, plastic, methodological, material. It is through the interdependence and cross-fertilization of these forces that the work evolves, rather than by application of pre-existing formulae.

Out of an investigation of informal plastic relationships certain number sequences may emerge which in turn provide more rigorous structuring for the visual counterpart; the evolution of the system depends on this dialogue between abstract numerical form and visual counterpart, and the dialogue itself can eventually be identified as a method, or set of procedures, upon which other forces can feed. In the process, the abstract system inevitably becomes more sophisticated (though I am not primarily concerned with elegance). A painting or relief represents a simultaneous crystallisation of ideas within each sphere.

The abstract systems cannot be applied in any context other than that in which they evolved—either to a different formal element within the same piece (such as a geometrically evolved sequence grafted on to a tone sequence) or to another version of the piece employing the same information. Nor can its method necessarily be followed in further investigations. These are not arbitrarily applied rules—as such they would be uneconomic and philosophically pointless—rather they have made themselves evident in the process of working, and testify to the triviality of the conceptual system in the wider context of mathematical thinking. Similarly, the physical material employed has little intrinsic value.


x1/x3
24/24
23/21
22/18
21/15
20/12
19/9
18/6
17/3
16/0
15/3
14/6
13/9
x2/x4
24/24
22/20
20/16
18/12
16/8
14/4
12/0
10/4
8/8
6/12
4/16
2/20

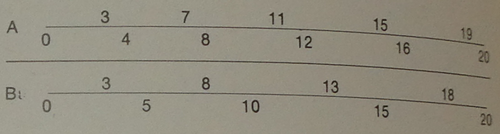
2. *Grid*
3.1.3.1. . .
3.2.3.2. . .



The structure of 'Relief 1, 1972' *(fig.* **1**, *p. 49)* underwent such an evolution. Its origins lie in an interest in gradual displacements; the first grid of this nature *(fig.* **2***)* consisted of two networks of repeated identical squares, each with different intervals:

for instance: A. 3.1.3.1.3.1 . . .
superimposed on: B. 3.2.3.2.3.2 . . . *(fig.* **3***)*

Sequence B gradually draws away from sequence A. Which can also be seen in terms of number relations:



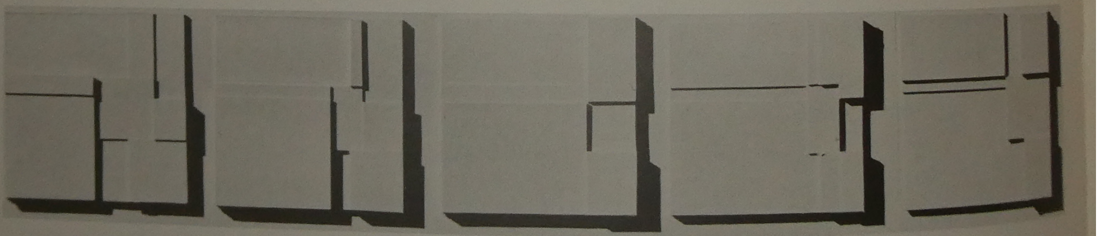
The networks in the geometric version rapidly get too far apart to be useful; they either have to be treated as finite, or extended by means of symmetries. Numerically, there is a return to the identity of the origin, though

A has completed five cycles: (3,1) . (3,1) . . . .
or: 4 . 4 . 4 . 4 . 4 .
and B, four cycles : (3,2) . (3,2) . . .
or: 5 . 5 . 5 . 5 .

that is, A has taken five steps of four to reach 20. It could return in the same way; in fact it could oscillate. So could B, at a different rate.

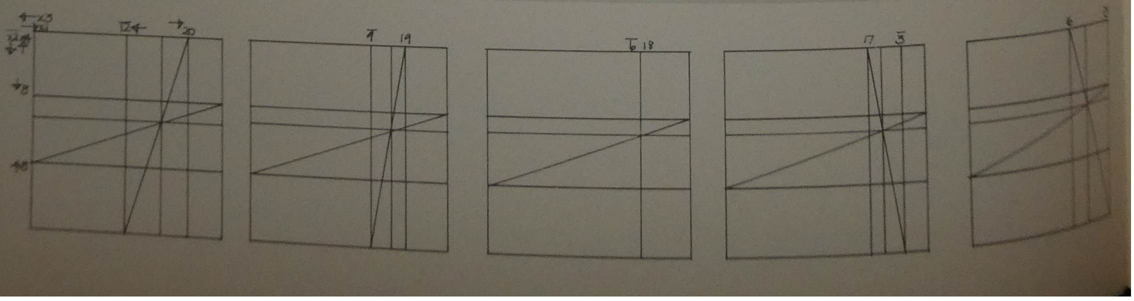
So, the geometric displacement is transferred to a purely numerical one, and out of this development arises the notion

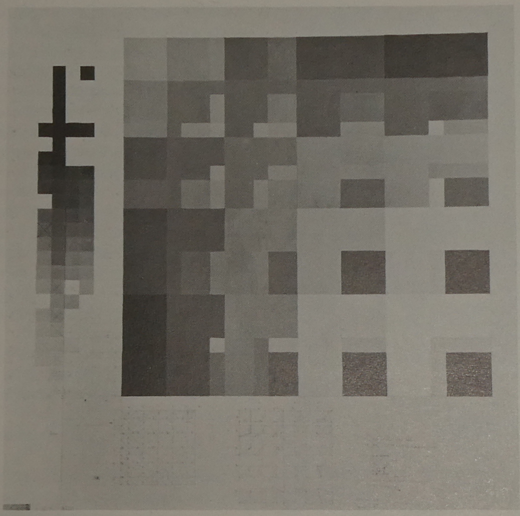
4. *Jean Spencer, maquette for Relief 1 1972*



Graham Bishop, Corry Bevington

5. *Jean Spencer, drawing for Relief 1 1972*





3. *Jean Spencer, gouache April 1970*

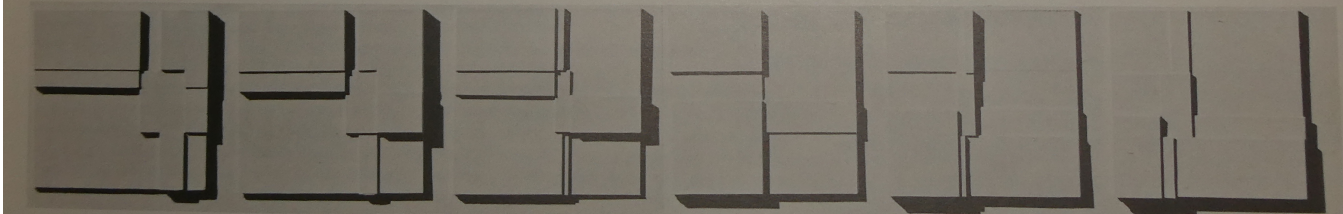
Graham Bishop.
Corry Bevington

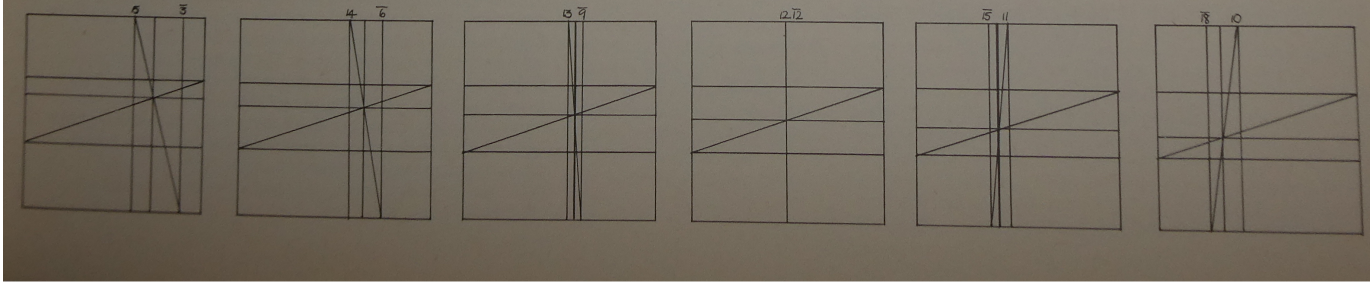
of 'instance', or separate identical units containing moments isolated from a continuous pattern of movement. The pattern is formed by points oscillating at different rates across the units, horizontally and vertically; the individual units contain all information relating to the structure at any particular moment; sequences of units reveal linear change, and from the total grid new patterns emerge—displacements, coincidences, repetitions, rhythms *(fig.* **4***)*.

From these primary structures secondary structures can be extracted. For instance: the point of intersection of the diagonal joining the horizontal divisions and that joining the vertical divisions. The movement of this point is a function of the composite movement of the four primary points, and, as such, its loci, traced over the whole grid, are of a very different nature from that of the simple numerical movements *(fig.* **5***)*.

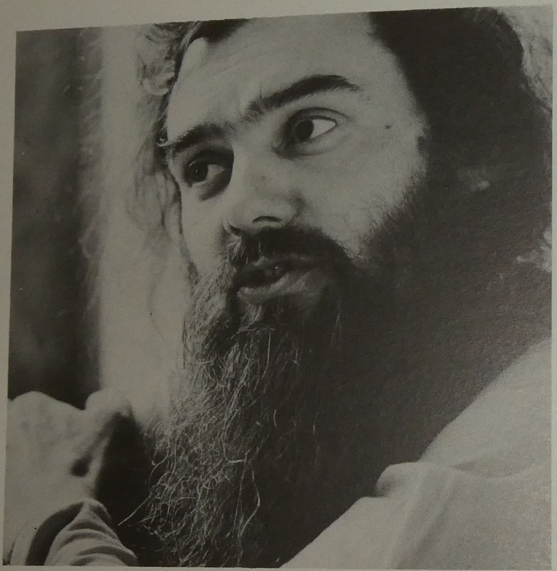
The actual data that emerges in the final form of the painting or relief aims at clarity and economy; an explicit statement of the *sense* (*not* essence) rather than the entire mechanics of the system.

The organization of the values of the elements (height of relief, tone, hue, etc) may be directly related to the actual proportional values of the elements (this can be very complex where the secondary structure is involved), or can be generated independently by a parallel system. For instance: a central element is constant (rather as the size of the unit is constant) and all other elements change, within defined limits, relative to this constant. In order to retain the readability of the linear structure no element is ever equal either to the constant, or to its adjacent elements.





Jeffrey Steele



Born in Wales 1931
First colour system paintings 1949
Research and teaching project, 'System and the Artist', at Portsmouth Polytechnic since 1970
Active Participation in New Music since 1970

Now teaching at Portsmouth Polytechnic

One man exhibitions:
1964 Grabowski Gallery, London
1966 McRoberts and Tunnard, London

Some recent group exhibitions:
1967 Carnegie International, Pittsburgh
1969 System, Amos Anderson Museum, Helsinki
1971 Matrix, Arnolfini Gallery, Bristol
Art Spectrum South

1

Revolutionary advances in technology have transformed human affairs and environment in a short space of time. Equally revolutionary advances in the arts remain bottled up in the minds of an educationally fortunate minority or become debased so that, again, the mental and physical environment suffers. We have the task, calling for a non-simplistic synthesis of information drawn from every field of enquiry, of detaching the manifold pollutant results of advanced technology from those which are genuinely beneficial. Some rough guiding principles for the analysis of similarities and differences between systems employed by artists in the creation of works of art, those elicited from language by linguists, those found in mathematics, those devised as conceptual tools by scientists and philosophers, those observed in nature, in society, constructed by engineers and so on are:

A. All that is not a subjective sensation or emotion can be regarded as systems.
B. A system is an arrangement, which exhibits regular constants and variables, of other systems.
C. Action is rearrangement: the destruction of a given system in favour of another.
D. A work of art is a man-made system whose function is revelation.
An observation is that systems (regarded synchronically) can:
E. Stand apart from each other.
F. Stand in hierarchical relationships.
G. Impinge upon each other in conformity to rules for whose high order of complexity there is no name.

2

To grasp the full extent and power of systems entails giving as much attention to chance, deranged, anarchic systems as to those with a more manifest regard for law and order. The gratuitous, the frivolous and the absurd are central to the enquiry. At first this seems to lead away from the interdisciplinary ideal and there are other difficulties. Apparent resemblances between systems are often superficial and their analysis tends to explain the collapse of interest in technological art and electronic music in the middle sixties. But the difficulties recede when we consider the evidence that human decisions are often founded on information which has not been evaluated at the conscious level of thought and the important role of intuition in even the most exact and complex regions of science and mathematics—disciplines which have themselves been shown in this century to be fundamentally indeterminate and contradictory. The systems approach is compatible with the evidence that human decisions are largely based on an intuitive feeling of rightness—*Rechtsgefühl*—but seeks to validate this subjective feeling by a massive information input which stands in true correspondence with reality before being refracted through the unconscious. At present the *Rechtsgefühl* of the majority is based on grievously inaccurate information about art.

3
Most *soi-disant* science-orientated art, for example, has no true correspondence with the practice of science or of art at any but the graphic design level at which it engenders an insidious form of environmental Kitsch. The systems approach does not distinguish scientific from non-scientific art. It treats art as an enquiry on equal terms with science, into questions which are not susceptible of proof in the traditional scientific sense, according all works of art, all movements in art, relations between movements, perceptual and iconographic propositions the status of systems, thereby bringing into question our whole taxonomic inheritance. Giving critical attention to particular systems requires no general system of suppositions to precede it. Freedom of action/number of options/refinement and precision of enquiry vary as mutual functions. To detach art, music, poetry, philosophy, education, science, technology from each other is as mischievous a disregard of the inherent complexity of their interrelation as to confuse them into a single entity. A rigorous enquiry process equivalent to that which accompanies the primary creative actions of the individual—learning to walk and talk—is necessary at the social level if creative work is to have a bearing on real problems.

4
The observation of systems in action suggests different categories of relationship between external reality, conscious awareness and non-conscious intuition. Systems (regarded diachronically) act in three main ways:

H. They break down, and the precise ways in which this happens are often hilarious.
I. They lead into increasingly complex regions beyond elucidation.
J. They exhibit completeness or cyclic properties.

The identification of relevant constants and variables in art reveals intersecting axes between mutually dependent polarities —serious/frivolous, simple/complex, social/private, material/conceptual, elegance/entropy, poles of statistical probability—none of these can exist without its negation and each is rooted in paradox. The range of possibilities for action is astronomical, the ethical responsibility for the social results of these actions daunting in the light of the evidence that the art of the last hundred years has, in fact, affected the dress, music, life-style and social attitudes of a significant minority of young people who display a generally questioning attitude, a search for alternatives, an interest in creative derangement which, a few generations ago, characterised only certain eccentrics—usually artists of a radical kind. The existence of this rough, hopefully benign social entropy suggests a continuing need for forms of art and criticism which are generous of clear, specific, rational, radical propositions.

5
Such activity is taking place in three main areas which roughly correspond to the diachronic categories of system identified above. New music, linked with conceptual art, provides excellent examples of the first category in which attention is diffused to the nameless periphery where several mutually incompatible systems dissolve into . . . what? Something sublimely chaotic but also very rich in information though too untidy to be called a synthesis. Orchestras such as the P.T. Orchestra, the Portsmouth Sinfonia, the Ross and Cromarty Orchestra could be models for a benign transformation of social institutions. Their delectation in jokes and nonsense is the exact counterweight to a partially frustrated social and technical perfectionism exemplified by the Scratch Orchestra's present struggle for ideological identity.

6
The second category of systems—those which recede into labyrinthine complexity—is found most typically in areas related to language—literature, linguistics, logic, philosophy—where creative statement and the analysis of structure combine. As in music new techniques reveal significant content in texts previously considered exhausted. Another similarity is the attempt to relate these findings to Marxist dialectic method and the nature of the controversy which this provokes. Recent texts, written in the light of linguistic analyses have a new range and density but when dealing with visual art the most competent theoreticians have, until now, confined themselves to those aspects which allow description in traditional literary terms while ignoring the very constructive/syntactic art to which their technical terminology most properly applies, to which the present exhibition is devoted and which belongs to the third category of systems.

7
Syntactic art makes definitive statements through directly perceived relationships. The knowledge that the universe is ephemeral, relative, contingent, contradictory frees the act of inventing structures which are none of these things from the deathly concomitants of social and intellectual puritanism. Human biological constants such as the erect posture and the structure of the retina, determine the unchanging validity of planometrics, colour and the right-angle, at least as referents. Over against these constants stand questions which bother the human sciences concerning the nature of perception, linguistic competence, memory, intuition—*Rechtsgefühl*. These, being imperfectly susceptible of objective measurement, are indeterminate. Syntactic art is doubly articulated with these two systems. Combinations of elements of a kind which neither nature nor any other human activity can produce, and which for that reason are sometimes intrinsically very simple, act as messengers between the known and the unknown. But the message is a syntactic and not a semantic one. The process can be compared to trying to communicate by signals with an intelligence on

another planet with whom we have no common experience and therefore nothing to communicate *about*. This must be the hidden, unconscious part of ourselves which has been variously postulated by art, mythology, philosophy, science—a system whose better understanding may contribute to our survival as a species.

8

My paintings since 1960 have been based on constants which can be notated, stored, retrieved, translated in different ways. Facture is important but outside the scope of the following analysis which is solely concerned with structure. A work's structure is a coherent stage in an ordered sequence of operations, each of which engenders a configuration of locational relationships which can be flexibly expressed within determinant rules. My work in this exhibition is constructed to this programme:

Call configurations S1, S2, S3 . . . S*n*. Call dimensions D1 (East-West) and D2 (North-South). Let numbers generally read from East to West and from North to South.

S1

Establish a plane surface P bounded by straight lines E1: E3 in D1, E2: E4 in D2.[1]

S2

Subdivide P into 30 equal areas A1/1, A1/2, A1/3 . . . A1/30 by 31 straight lines L1/0, L1/1, L1/2 . . . L1/30 parallel to and including; E1 and E3.[2]

S3

Vary all areas A1 by displacement of lines L1/1 to L1/9, L1/11 to L1/19 and L1/21 to L1/30 in D1 by projection of $1\frac{1}{2}$ cycles (3 troughs/crests) of wave W1.[3]

S4

Transform L1/3, L1/15 and L1/27 by $2\frac{1}{2}$ cycles (5 troughs/crests) of a wave W2 into curved lines and L1/9 and L1/21 into reciprocal curves. Let L1/0, L1/6, L1/12, L1/18, L1/24 and L1/30 remain straight lines and transform all remaining lines L1/1, L1/2, L1/4, L1/5, L1/7, L1/8 etc. into curves determined by these lines.

S5

Subdivide P into 10 equal areas in D2 bounded by 11 straight lines L2/0, L2/1, L2/3 . . . L2/10.

Transform L2/1, L2/5, L2/9 by $1\frac{1}{2}$ cycles (3 troughs/crests) of a wave W3 and L2/3 and L2/7 into reciprocal curves. Let L2/0, L2/2, L2/4, L2/6, L2/8 and L2/10 remain straight and let any number (*n*-11) of curved lines in D2 be determined by these lines.

S6

Establish 31*n* points on S4 using *n* equally spaced straight lines in D2.

Map S4 to S5 by reference to these points.

S7

Construct within each area A1 (as determined by S6) an area A2/1, A2/2, A2/3 . . . A2/30 extending from E2 to E4 of variable proportion J in D2 bounded by lines L3/1, L3/2, L3/3 . . . L3/60.

Divide P into 2 halves, H1 and H2 along L2/5. Let $J=\frac{1}{2}$ the D2 proportion of A2 along all edges E and along L2/5. Let J have maximum value at centre of H1 and minimum value at centre of H2 and let other values of J be determined by these values.

S8

Transform E1 and E3 by $2\frac{1}{2}$ cycles (5 troughs/crests) of a wave W4.

Transform all lines L3 by reference to this transformation.[4]

S9

Amplify L3/4, L3/7, L3/10 . . . (i.e. every third L3, starting with L3/4 . . . L3/58 by a factor F about straight lines joining their extremities.[5]

Designate areas between L3/4 and L3/7, L3/10 and L3/13 . . . (i.e. alternate areas) . . . L3/52 and L3/55 as areas A3/1, A3/2, A3/3 . . . A3/9.

S10

Amplify L3/6, L3/9, L3/12 . . . (i.e. every third L3 starting with L3/6) . . . L3/57 as determined by S8, by factor F.

Designate areas between L3/6 and L3/9, L3/12 and L3/15 . . . (i.e. alternate areas) . . . L3/54 and L3/57 as areas A4/1, A4/2, A4/3 . . . A4/9.

S11

Invert the *Mirror-Image* of S9 and *Superimpose* this on S10.

Adjust all A4 numbers to read from North to South.[6]

S12

Subdivide P into 5 equal areas A5/1, A5/2, A5/3, A5/4, A5/5 by 6 straight lines L4/1, L4/2, L4/3 . . . L4/6 in D2 along intersections of lines L3.

Exchange lines L3 between areas A3 and A4 so that each area A5 contains either crests or troughs but not both.

Establish and *Apply* a system of preferential overlapping 01 within and between A3 and A4.

S13

Transform lines L4/1 (E2) and L4/6 (E4) by wave W3.

Adjust lines L3 in A5/1 and A5/5 to this transformation.

S14

is A5/5, A5/1, A5/2, A5/3.

S15

is A5/4, A5/5, A5/1, A5/2.

S16

is A5/3, A5/4, A5/5, A5/1.

S17

Designate a cycle of nine related chromatic values, C1, C2, C3 . . . C9 so that C9 is equal to C1.

Designate three relative luminosity values T1, T2, T3.

Allocate colours:

---

1. This primitive system is capable of infinite variation of scale and proportion by adjustment of the two dimensions.

2. The choice of 30 areas permits certain future developments and precludes others.

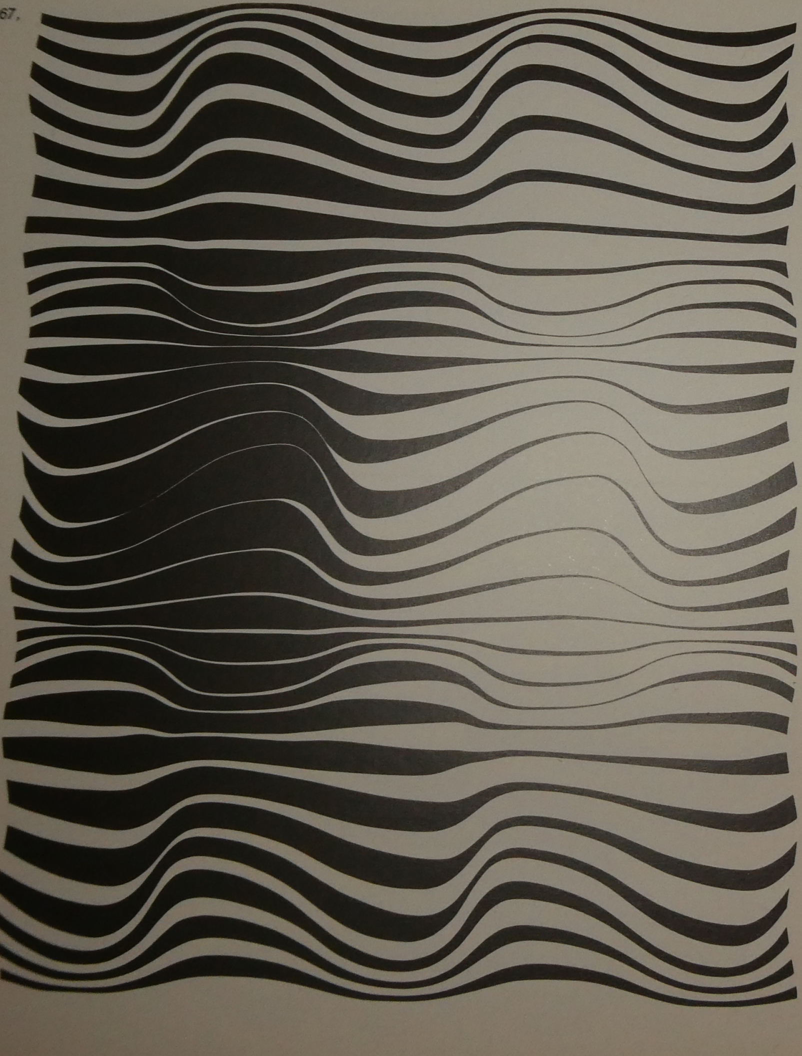
3. The choice of structure of waves W also limits future developments.

4. The choice of W4 amplifies some waves and attenuates others.

5. The choice of F favours certain developments and inhibits others.

6. Areas A3 and A4 are cyclic, i.e. capable of lateral repetition without breaks.

1. Jeffrey Steele, Aallotar, 1967, 50" × 40", oil on canvas. Colour: Black, White.



in S14:

A3/1, C2, T3. A4/1, C6, T1.
A3/2, C3, T2. A4/2, C7, T2.
A3/3, C4, T1. A4/3, C8, T3.
A3/4, C5, T2. A4/4, C1, T2.
A3/5, C6, T3. A4/5, C2, T1.
A3/6, C7, T2. A4/6, C3, T2.
A3/7, C8, T1. A4/7, C4, T3.
A3/8, C1, T2. A4/8, C5, T2.
A3/9, C2, T3. A4/9, C6, T1.

in S15:

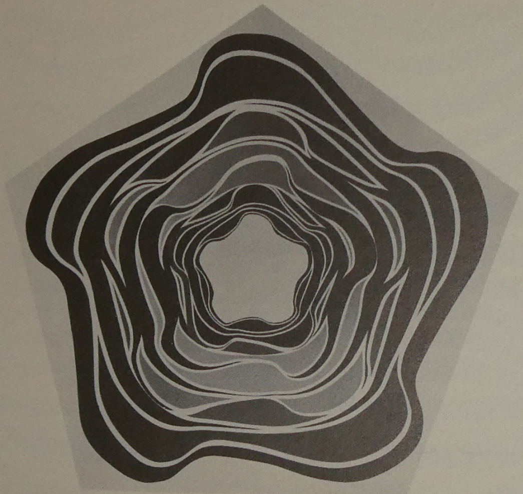
A3/1, C3, T2. A4/1, C7, T2.
A3/2, C4, T1. A4/2, C8, T3.
A3/3, C5, T2. A4/3, C1, T2.
A3/4, C6, T3. A4/4, C2, T1.
A3/5, C7, T2. A4/5, C3, T2.
A3/6, C8, T1. A4/6, C4, T3.
A3/7, C1, T2. A4/7, C5, T2.
A3/8, C2, T3. A4/8, C6, T1.
A3/9, C3, T2. A4/9, C7, T2.

in S16:

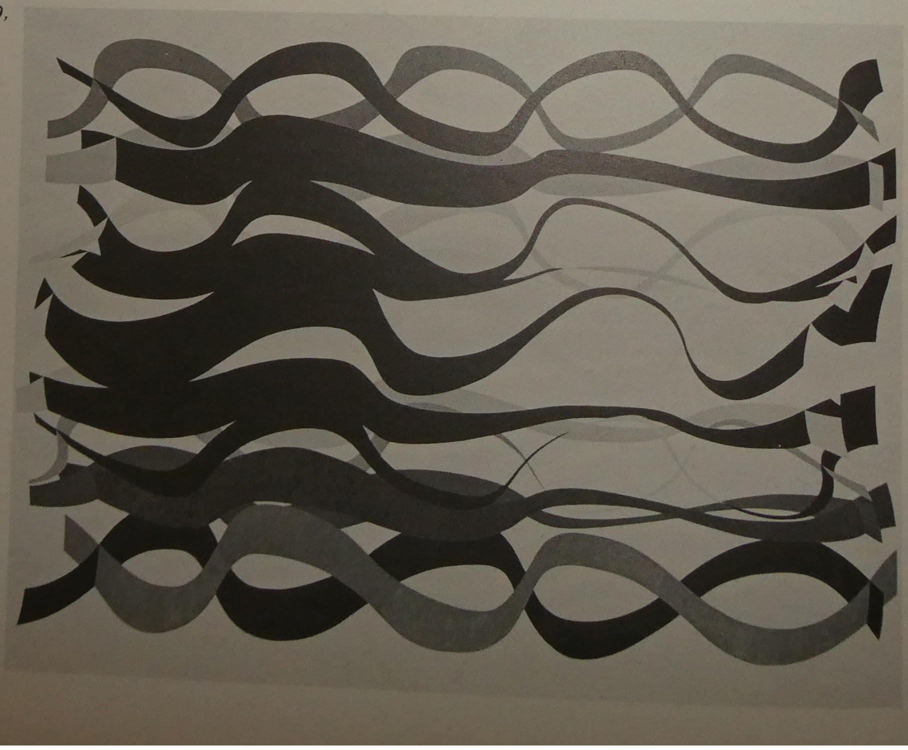
A3/1, C4, T1. A4/1, C8, T3.
A3/2, C5, T2. A4/2, C1, T2.
A3/3, C6, T3. A4/3, C2, T1.
A3/4, C7, T2. A4/4, C3, T2.
A3/5, C8, T1. A4/5, C4, T3.
A3/6, C1, T2. A4/6, C5, T2.
A3/7, C2, T3. A4/7, C6, T1.
A3/8, C3, T2. A4/8, C7, T2.
A3/9, C4, T1. A4/9, C8, T3.

The illustrations show three paintings whose structure employs the programme described on page 54.
Fig. 1: up to and including S8.
Fig. 2: up to and including S12.
Fig. 3: up to and including S13.

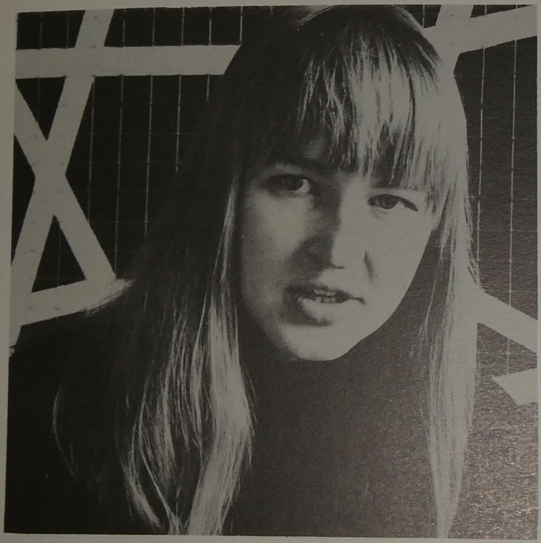
2. *Jeffrey Steele,* Ricercar,
1968/1970, 65" × 68",
Pentagon, oil on canvas.
Colour: *Cyclic system of*
eighteen colours.



3. *Jeffrey Steele,* Medvsa, *1969,*
36" × 48", oil on canvas.
Colour: *Cyclic system of*
eighteen colours.



Gillian Wise Ciobotaru



Born in London 1936
Studied at Wimbledon and Central Schools of Art
Unesco Fellowship, Prague 1968
Repin Institute, Art Academy, Leningrad; British Council postgraduate scholarship 1969-70
Married to Soviet architect Adrian Ciobotaru

Now teaching at Chelsea School of Art

One man exhibitions:
1963 Relief structures, Institute of Contemporary Arts, London (with Anthony Hill)
1967 Axiom Gallery, London

Some group exhibitions
1961 Construction: England 1950-60, Drian Gallery, London
1965 8th Tokyo Biennale
British Sculpture in the '60's, Tate Gallery, London
1968 Relief/Construction/Relief, Museum of Contemporary Art, Chicago
1969 Nuremberg Biennale
System, Amos Anderson Museum, Helsinki
1971 Four artists: Reliefs, Constructions and Drawings, Victoria and Albert Museum, London
Matrix, Arnolfini Gallery, Bristol

Concerning the idea of Constructivism (in the historical sense) with its vision of the potential effect of technology on art and society, one question always strikes me as unresolved. To what extent is art a product and fulfilling a social need? The polarisation that emerged between a mystic functionalism (Malevich, Mondrian, Vantongerloo) and direct social service (Tatlin, Lissitsky and the Bauhaus) defines two very different ways of using a Constructive aesthetic.

Half a century later this range of forms—simple geometric elements—is still the one that I, along with a number of other artists, want to work with. Given as a basis the work that has and is being done in this area, I feel we should begin to think more clearly about mystic and functional values, both claimed and demonstrated. And above all to show that analytic and emotive qualities are not mutually exclusive.

Vis-à-vis the works in this show, I would say mine fall into the category of private studio works done in the search for a general principle (and/or formal language) that will form a basis for a future body of work. I find it difficult to think in terms of private collections as being the aim of an artist's function, although it plays a vital supporting role at times. Consequently, the work seems to be projected into an interesting 'vacuum' that could later be filled by different demands of art.

Everything exhibited here is based on the straight line and the rightangle (I have worked almost exclusively with orthogonal relationships since my first contact with constructive ideas—via Biederman in 1958). From a frontal position the forms can be seen as a regular grid, although quickly becoming complex when extended in depth. The emphasis is on contour, from which forms emerge. In earlier works I found I was increasingly detaching contour and line from the planar forms of relief structures, so for a series of works I took the premise of one line, either open-ended or a closed loop, subjecting it to various tensions and distortions on a predetermined space-grid. This enabled me to plot forms two-dimensionally, something I had previously not done, for this use of contour seemed to 'hold the space open' and prevent the work from becoming a pictorial composition in fixed boundaries. As another abstraction of the same concept I have some works using point and rhythm . . .

Aspiration:

To be a radical conservationist: that is, to pursue and sustain those advanced European art ideas, that have proved so subtly difficult, in a situation where accelerating change is a demanding convention.'[1]

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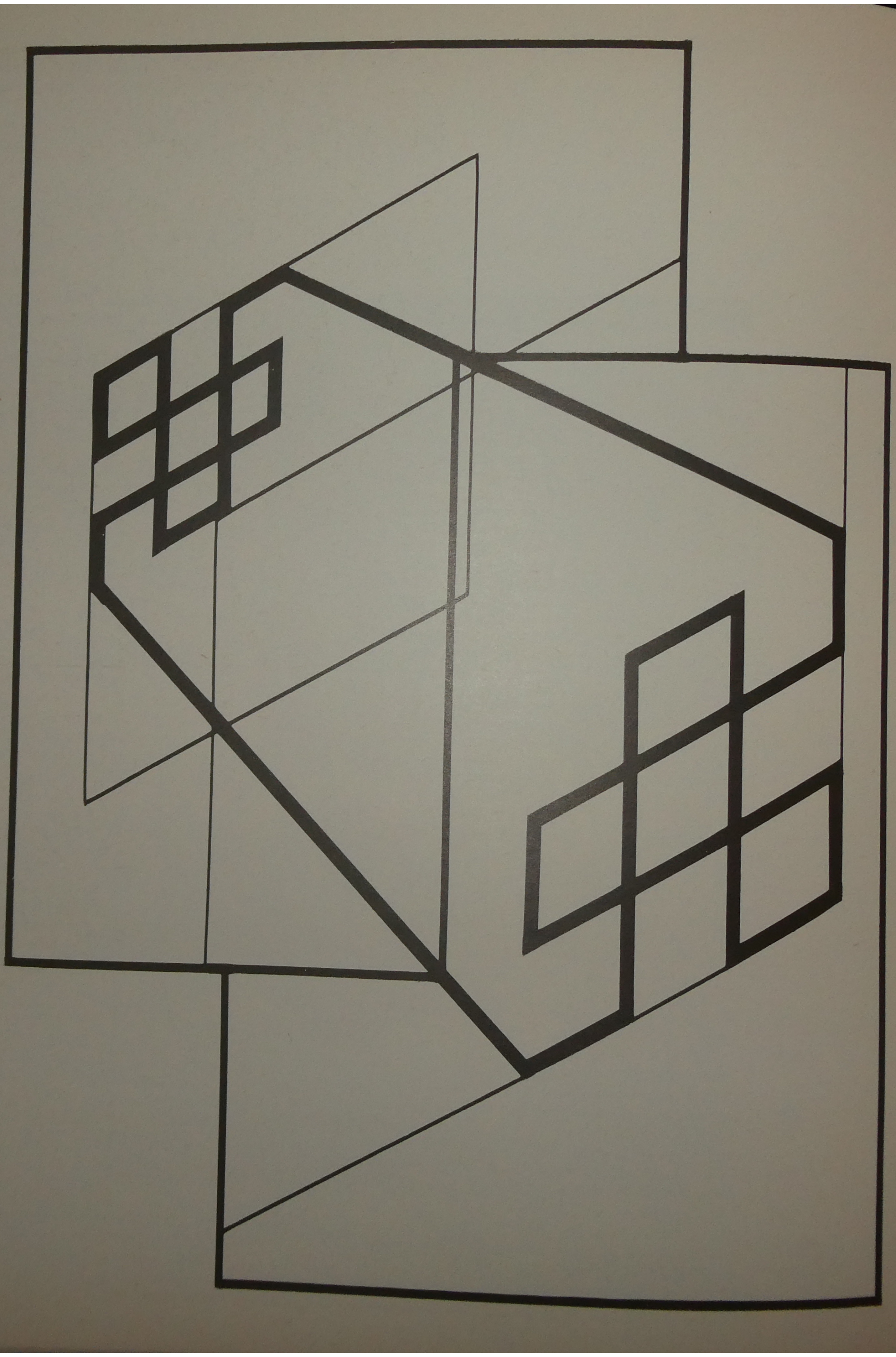
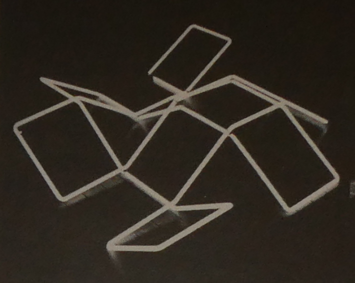
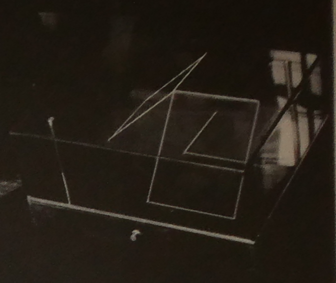
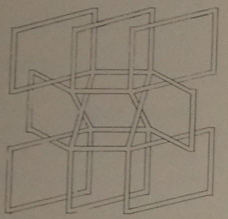
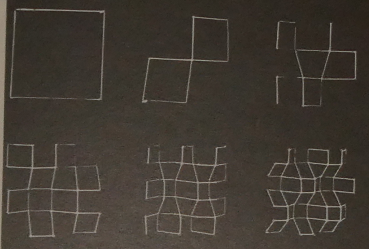
[1] *Articles by Gillian Wise include: 'quantities and qualities',* Leonardo *1968 Vol 1 No 1 and 'notes on the art work as an object'* DATA, *ed. Anthony Hill, Faber and Faber 1968.*

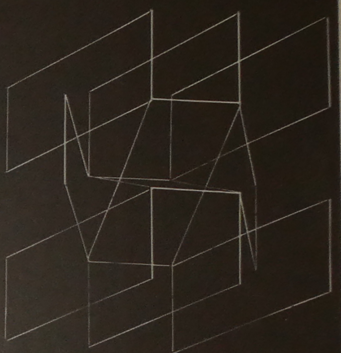


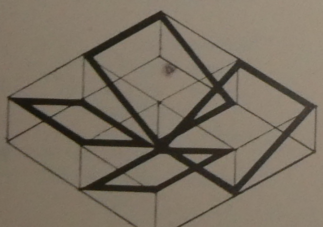


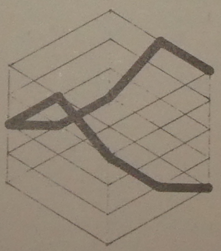


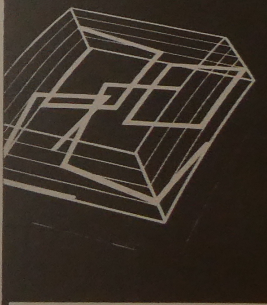






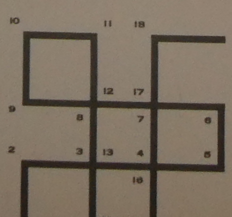






Some of the forms shown in No. 4 are developed and interpreted in the surrounding works. To help make the connections here is a brief key:

1 is derived from **d.**
2 is derived from **b.**
3 is derived from **c.**
5 is derived from **c.**
6 is derived from **b.**
7 is derived from **b.**
8 is derived from **a.**
9 is derived from **c.**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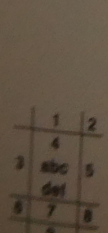
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Measurements in inches except where stated
In three dimensional structures height precedes length precedes depth

Richard Allen
Systems Project 1971/2
84 x 252 (six canvases each 84 x 42)
Acrylic on canvas

John Ernest
Moebius Strip 1971/2
84 x 84 x 23
Wood, plywood, polyurethane paint

Malcolm Hughes
Four White Reliefs 1972
each 48 x 96
Wood, hardboard, emulsion
+ Environment
8 x 10 x 10 feet

Colin Jones
Rotation, Reflection, Progression Structure 1972
Relief structure in three parts
152 x 424 x 18.6 cm
Wood, pigments
Assistant: Gyorgy Josza

Michael Kidner
Systems Project 1971/2
Column: 84 x 16 x 16
Fibreglass
Painting: 84 x 126
Acrylic and photographs on canvas
Assistants: Jean Campbell (photography), Graham Knight, William Kidner

Peter Lowe
16 Stratified Cubes 1972
32 x 192 x 12
Stove enamelled aluminium
Manufactured by: John Holt

James Moyes
A Vibration Tent 1972
11 x 15 x 15 feet
Steel, wood, canvas and electrics

David Saunders
Untitled 1971/2
8 x 20 x 20 feet
Polyester, PVC and steel wire

Geoffrey Smedley
Proposition 1972
96 x 65 x 65
Aluminium alloy and plastic laminate

Jean Spencer
Relief 1 1972
10 units, each 24 x 24
Wood, hardboard, emulsion

Jeffrey Steele
Abakum 1972
84 x 252 (3 canvases each 84 x 84)
Acrylic on canvas
Structure: a. Planometric. A stage in an ordered sequence of operations each of which engenders a configuration of locational relationships which can be flexibly expressed within its determinant rules
b. Chromatic. As above

Gillian Wise Ciobotaru
a. Reflexion/Connexions 1972
28 x 84 x 84
Aluminium, wood, perspex, neon and optical fibre
b. Reflexion 1972
56 x 40
Photo-sensitized, anodized aluminium
c. Connexions 1972
64 x 48
Photograph

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